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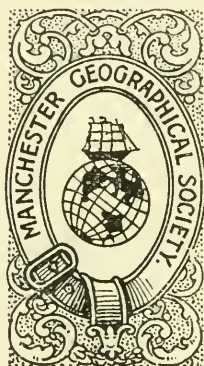
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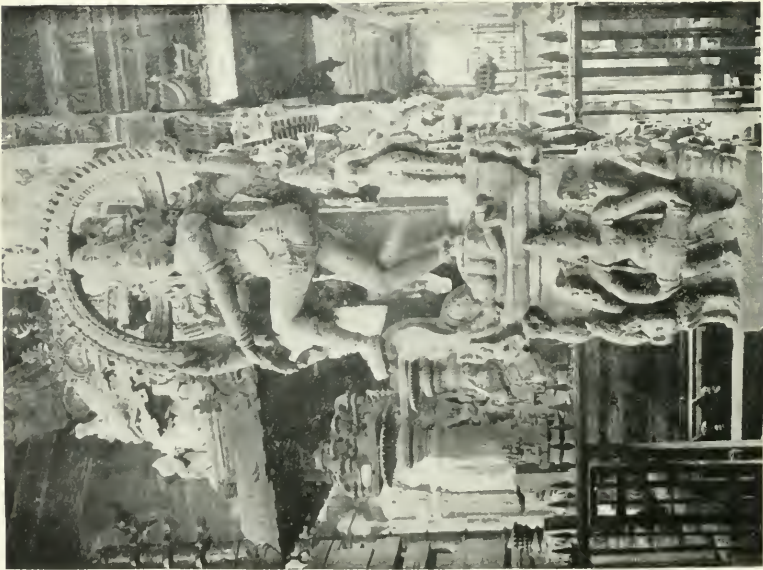


Fig. 1. In the Temple at Madura. Pillar carved with dancing figure of Shiva.

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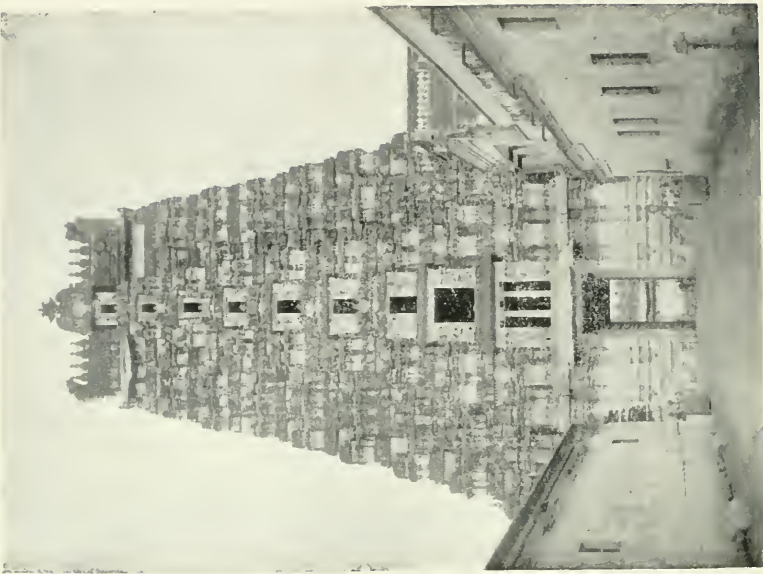


Fig. 2. Temple of Sri Ranganam : Inner Eastern Gopuram.

E.W.M.

The Journal

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* * *

SOUTHERN INDIA—SOME DRAVIDIAN LANDMARKS.

By EDWARD W. MELLOR, J.P., F.R.G.S.

(Addressed to the Society in the Houldsworth Hall, on
Tuesday, March 16th, 1915.)

Knowledge of the aboriginal inhabitants of India is hidden from us by a veil of historical obscurity.

From cairns, barrows and dolmens, which have been found in different districts, we learn that the prehistoric Indian people passed from a Pæolithic, through a Neolithic, to an Iron age; but what those aboriginal Indians were like is very much a matter of ethnological conjecture.

Fergusson, the historian, points out that:—"The great master-fact that explains almost all we know of the ancient history of India, is our knowledge that 2,000 years, or more, before the birth of Christ, a Sanskrit-speaking nation migrated from the valleys of the Oxus and Jaxartes." These people, known as Aryans, came across the Indus in such numbers as to occupy, first, the country now known as the Punjab, and then, gradually, the whole arable tracts of land in the valleys of the Indus and Ganges. Thus, their civilization, their language, and their religion gradually established themselves throughout the whole northern base of the Indian peninsula.

As centuries elapsed, the ancient language underwent change, and by the time of Alexander the Great, Sanskrit had been superseded by Prakrit, a vulgar tongue founded upon Sanskrit, and in turn, out of Prakrit has grown the modern Hindu. The religious faith of these ancient Aryans

was purer and more spiritual than the Brahmanical, or Hindu, religion which grew out of it.

Warlike, enterprising, and good colonists though those historic Aryans were, they seem never to have subjugated the still more ancient Indian race inhabiting the extreme south of the Indian Peninsula. This Southern race was of shorter stature than the Aryans, of darker skin, having a higher nasal index, and speaking a widely differing language. Compared with the Aryans, these southern people were a very primitive, illiterate, and almost savage race; hence the name "Dravidians," for "Drāvida" signifies "being beyond the pale of castes"; and it is a name which, in supercilious contempt, the Brahmans gave to the people they could not conquer. The Dravidians maintained their independence, though regarded by the rest of India contemptuously, as "outside the castes."

The Dravidian race is to-day expanded into eight principal tribes, each speaking its own different dialect of the same original language. Perhaps the most important, and the most numerous, of these Dravidian tribes, are the Tamils and the Telegus; while the most ancient, and the most aboriginal, in primitive habit and mode of life, are the Todas, a comparatively small tribe, still to be found in the heights of the Nilgiri mountains.

It was not to be expected that these two great races, the Aryan and the older Dravidian, could dwell in close contiguity to each other for hundreds of years without a mutual influence upon each other. And such in the nature of things did take place; inter-mingling of blood, of religious customs, and of languages, produced by degrees an Aryo-Dravidian district.

To quote Colonel Marshall: "In order to absorb all the savage tribes, the Brahmans opened the portals of their religion, and incorporated the many gods of the aborigines with the ancient deities of their vedic pantheon. The pure Hindu religion, although thus actually debased in the process, probably became an instrument of even greater efficiency when wielded by clever priests for the purpose of obtaining an ascendancy over races in an extremely low state of culture. And we recognize this truth in the great influence which Hinduism and the Sanskrit tongue have obtained over the entire Indian continent."

That this notable condition of things had a most marvelous development is evidenced by the wonderful series of temples dedicated to Hindu deities erected in Southern India by Dravidian Rulers and Kings, dating from the commencement of the Christian era down to our mediæval times.

These remarkable temples are veritable landmarks, not only because of their origin, but also because the Dravidian style of architecture differs widely from the Aryo-Indian and Mahommedan Architecture which is seen further north. According to Fergusson, the great majority of Dravidians were worshippers of the Hindu god Shiva, the destroyer and reproducer, and the minority worshipped Vishnu, the preserver; as we proceed northwards the two sects, Shivites and Vishnavites, become more equal; until further north, in Bengal for example, the proportions are reversed, and the Vishnavite Sect is the more numerous.

We visited some of these Dravidian Masterpieces, and travelled hundreds of miles in the southern apex of the Indian Peninsula, south of the latitude of Madras, starting our journey at Old Cochin, as it is frequently called, where there is an extensive backwater forming a fine natural harbour. Cochin, on the Malabar Coast, was the first European settlement in India. It was there that the Portuguese established themselves in 1496, and it was off Cochin that the notorious German cruiser "Emden" committed a raid on shipping in October, 1914. From Cochin we went across to Tanjore, where there is a very perfect temple which gives a good idea of the general design aimed at in other temples where the plan is more difficult to comprehend. Next we went down to Rameswaram, a holy shrine to pilgrims, and famous for its vast corridors, about a mile in length. Then we came to Madura, with its wealth of carved pillars and courts. Going northwards we visited Trichinopoly and the enormous temple of Sri Rangan, with another wealth of carved pillars. After a brief visit to Kumbakonam and Chidambaram, we arrived at Mysore and Seringapatam, full of memories of Hyder Ali and Tippu Sultan. Then we went up into the Nilgiri Hills, and visited a tea estate and a Toda encampment. Finally we visited the most ancient temple of Dravidian Architecture extant, at Mahabalipuram, known as the "Seven Pagodas."

Cochin, longitude 76 degrees 17 minutes East, latitude 9 degrees 59 minutes North, is, as already mentioned, situated

on a backwater of the Arabian Sea, which is one of a series, or chain, of lagoons or backwaters extending along the Malabar Coast parallel to the sea, and receiving the numerous streams which descend from the Western Ghâts. The Cochin lagoon is about two miles wide, and on its western bank stands the ancient town which we call Old Cochin; the modern Cochin is on the eastern bank, and is called Ernakulam. The chief exports of Cochin are cocoanut oil, yarn, rope, fibre, coir matting, copra, areca nut, ginger, pepper, fish and prawns. The chief imports are rice, cotton piece goods, raw cotton, twist, metals, hardware, cutlery, and sugar.

Cochin is at the end of a metre gauge branch line, 70 miles long, with the station on the Ernakulam side of the lagoon and the railway wharf on a small backwater from the main lagoon. A considerable shipping trade is done here in bamboos, sugar-cane, and so forth.

It is interesting to remember that Vasco da Gama came to Cochin in 1502 and established a Portuguese factory. He died at Cochin on Christmas Day, 1524, and his body was buried in the Franciscan monastery which then existed in Cochin. The body was subsequently removed to Belem Monastery Church, near Lisbon.

Ever since Portuguese times the Roman Catholics have had great influence at Cochin, hence there is here a large proportion, about one-third, of the population who are Christians. Several European houses, with a Roman Catholic Church prominently showing, face the waters of the lagoon, forming part of the sea front of Ernakulam and having a level green sward in front as the promenade of the place.

We stayed in the "Officers' Staff Quarters" of the South Indian Railway. There is no hotel in Cochin, and as it is at the end of a metre gauge branch line 425 miles from the head office at Madras, the Railway Company built this bungalow so that an Engineer or Superintendent coming here might have a place in which to rest his head. The manager of the railway most kindly invited Mrs. Mellor and myself to make use of this bungalow during our stay at Cochin, and thankful indeed we were to do so, though of course we had to take our own bedding, our own servant, and food. The house had a deep shady verandah, which afforded a gratifying pro-

tection from the heat of the sun, as did also the lofty palm trees near which the house was situated.

On a narrow, flat island in the lagoon, visible from the verandah of the bungalow, is the red-roofed Residency where the representative of the British Government resides.

In the lagoon at Cochin great use is made of large fishing nets. They are lowered into the water by means of long levers attached to posts on the shore, the posts and levers are long bamboos or branches of trees. The nets are called "China" nets, and were introduced by the Dutch. I believe that these nets are to be seen nowhere else in India, though I have seen some somewhat similar on the Irawaddy.

The Indian Peninsula is a vast tract of country, and though we were travelling across the apex of the triangle, it was a journey of 300 miles from Cochin to Tanjore, which we next visited. Tanjore, with its thatched and red tiled roofs, has a very oriental appearance. From time immemorial Tanjore has produced skilled artizans, and is justly famous for its silk-weaving, embroidery, copperware, and jewellery.

It is a town of nearly 60,000 inhabitants, and ranks as the eighth largest town in the Madras Presidency; yet there is no hotel, nor any place where the travelling European can decently sleep at night, save only at the Railway Station, where the South Indian Railway Company has provided bed and bathrooms, but travellers must take their own bedding. The view from the bedroom verandah included the goods yard in front, and away in the distance the lofty tower of the great temple, the first great Dravidian land-mark, which we visited.

The temple dates from the eleventh century, and like our own mediæval buildings, is surrounded by a moat, and then by a lofty bastioned wall. The moat and wall give the temple the appearance of a mediæval fortress, and such indeed it practically was, for it withstood many sieges. Even so recently as 1758 it was unsuccessfully besieged by the French, and again in 1771 it was besieged and taken by the English. The temple was then turned into a camp for 30 years, until in 1801-1802 the Rajah Sarfogi purified the temple and rededicated it to the god Shiva. Rising above the wall is the great tower over the shrine. As the huge wall encloses all the temple buildings, it is comparatively easy here at Tan-

jore to understand the arrangement of the temple and its adjuncts.

A bridge over the moat takes us through a lofty gateway, then along a passage between whitened walls, 170 feet long, to a second gateway. These gateways are called "Gopurams." "Gopuram" is a Hindustani word meaning "the gate of a Pagoda." This inner Gopuram of Tanjore is ornamented on either side by a gigantic figure, presumably of the god Shiva. Passing through, we enter the Courtyard of the temple, 800 feet long by 415 feet wide, and completely surrounded by cloister chapels, each of which contains a large "Lingam." Lingam is a word derived from the Sanskrit, and signifies a symbol of Shiva as the god of reproduction.

Raising its head 190 feet into the sky is the pyramidal tower over the shrine and idol of the god. A 60-yard Lancashire factory chimney is fairly lofty, but this tower is 10 feet higher. In front of the shrine is a pillared hall or portico, and some 50 or 60 feet farther forward is a curious flat-roofed structure carried on handsome pillars. It is the shrine of Nandi, the sacred Bull of Shiva.

Moving along the path into the courtyard, and turning round we saw that the two Gopurams, through which we entered, were in flats or storeys. This horizontal style of floors, or storeys, placed one over the other, is a peculiarity of Dravidian architecture, as distinct from the vertical and bulbous style prevalent in other parts of India. The stonework is elaborately carved and decorated. The inner Gopuram is probably as old as the temple itself; it is 60 feet high, and has three storeys above the doorway. The outer one is more lofty, 90 feet high, and has five storeys, but is of much later date, viz., the 16th Century.

The shrine of Nandi is a stone Mandapam, *i.e.*, an open Pavilion or shrine, the roof of which is carried by beautifully wrought and carved pillars, and with specially fine coloured designs in the ceiling. The Mandapam shelters Nandi, the sacred Bull of Shiva. He is a huge monolith of black granite, 16 feet long, 7 feet wide, and 12 feet high, said to weigh 25 tons.

The Indians have a curious legend about this bull. By some miraculous power, long, long ago, the bull continued gradually and slowly to grow larger and larger until it was

feared that Nandi would grow too large for his Mandapam. At last one day a very holy man drove a nail into the back of Nandi's neck, and the monolith has remained inert and stationary ever since.

A tall bronze pillar stands immediately in front of the Nandi Mandapam. From the curiously wrought arms at the top of the pillar are suspended a number of small bells, made, I believe, of silver. A gentle puff of air causes one or more of these bells to tinkle melodiously, and a more powerful gust will cause a general jangle. The effect is very pretty, and recalls Rudyard Kipling's song with "the tinkly temple bells." I suppose that we Christians would call this a heathen temple, yet there is much that is beautiful, and inspires a reverential feeling—mixed, however, with much that produces the opposite effect. At each corner of the pedestal a small Nandi Bull looks west towards the main temple.

The main temple is said by one writer to be the most beautiful and effective of all Dravidian Temples. A broad flight of steps ascends to a Mandapam, or pillared hall, which serves as a portico to the Vimânah, or sanctuary, in which reposes the idol of the god in total darkness, except, of course, for the ceremonial lamps when they are used, and for such light as passes through the pillared entrance. We Christians can roam about anywhere in the temple buildings, and about the great Nandi Bull, but we may not ascend those steps, nor enter the Vimânah.

Immediately over the idol the pyramidal tower rises to a height of 190 feet in 13 storeys, the dome-shaped summit being a single block of granite, weighing about 80 tons. Some engineering work was done here about 1,800 years ago; it is said that an inclined plane was used. The "Sikra," or gilded spike-like ornament at the top, is 15 feet in height.

The outside base of the Vimânah has inscriptions in ancient Tamil, from which we learn that this temple was built in the middle of the eleventh century by King Rajaraja, of the Chola Dynasty of Dravidians, who then reigned in Southern India, and that it was endowed by him and by his son Rajendra Rajah. This great Tanjore Temple is one of the very few in Southern India which were built at one time and on one plan, therefore it is good to have seen it first. Other temples, though larger, have been built and added to

at various times, with the result that the uniformity in design which you find at Tanjore, is wanting in them.

A journey of 227 miles almost due south brings us to Rameswaram, a small town of 6,000 to 7,000 inhabitants, situated on the island of Pambam, practically attached by a causeway to the mainland, and which may be described as the stepping off place for Ceylon.

The palm trees and the great acacias afford grateful protection from the torrid heat of the tropic sun, in this very hot and dusty little town. There is no accommodation for Europeans. If you have your bedding with you, you can sleep in an empty room at the station, and such a thing as an ekka or a carriage is unknown. Bullock carts are all the driving accommodation available; except that they are innocent of springs, these bullock bandys, as they are called, are not to be despised. The palm thatch cover shades you from the hot scorching sun, and having seen that the floor of the cart is not saturated with cocoa-nut oil, you lay your rug upon it, then with a cushion, you have a couch upon which you can dose off to sleep, while the patient little bullocks jog along, until a particularly bad jolt wakens you up.

The Rameswaram Temple rejoices in the following tradition :—In the days when the world was young, a ten-headed demon, named Ravana, stole Sita, the beautiful wife of Rama, who was one of the incarnations of the god Vishnu, the Preserver. The demon Ravana carried off Sita to his kingdom of Ceylon. In a rage came Rama to Ceylon, and, assisted by a great army of monkeys, conquered the island, slew the demon-king, and recovered his beautiful wife Sita. Returning from Ceylon, Rama bathed here at the junction of the Bay of Bengal and the Arabian Sea, and according to the firm belief of many million Hindus, the god Vishnu, in the form of Rama, in order to expiate the slaughter of his enemies, founded this temple and dedicated it to the god Shiva. Thus in this temple we find a curious anomaly : Vishnu, or Rama, the Preserver, and Shiva, the Destroyer, are worshipped impartially. You have it in the name of the place, for Rameswaram signifies “the place where Rama worshipped Shiva.”

We went in by the Eastern Entrance to the temple, and passed, first through a pillared portico, somewhat hidden by a palm-thatch awning; then through a wonderful Gopuram,



E.W.M.

Fig. 3. Temple of Sri Rangam : Seshagiri Rao's Mandapam.



E.W.M.

Fig. 4. Great Tank at Kumbakonam.

carried ten storeys above the roof of the temple, and all of richly wrought stone. This Gopuram, 110 feet high, is one of the loftiest in India, and is a fine example of the Dravidian style. If it had been plain without ornamentation, Ferguson says "it would have reproduced more nearly the effect of the Egyptian propylon than any other building of its class in India."

But the glory of this Rameswaram temple rests in its vast corridors. The temple is rectangular in form, and circumvallating three of the sides, are huge corridors. We entered one of the outer corridors, which was 700 feet long, the roof, 30 feet high, consists of massive slabs of granite, carried by a double row of stately pillars, each of which usually consists of a single block of stone standing on a platform 5 feet high. The roof slabs rest on the great bracket capitals, so usual in Indian architecture.

We noticed two holy men sitting on their heels who intently watched me and my camera.

There are some 4,000 feet of corridors in this temple. The pillars of the outer corridors are carved with flowers and conventional signs and symbols, but in the central corridor, which leads to the holy shrine, the pillars are carved with statues, more or less grotesque in character. First, there is a dragon with an elephant's trunk; the next pillar has a man excellently wrought, beating a drum or tom-tom, he is possibly the builder of this colonade; the next pillar has a figure of Shiva dancing, which seems to be a favourite attitude in which to represent the god; other pillars portray different divinities of the Hindu pantheon. The capitals are adorned with "yalis," or dragons, with wide-open mouths, and protruding tongues. A strange accompaniment these, surely, to the approach to the most sacred spot in the temple, the shrine where high-caste Hindus alone are allowed to enter.

A quaint ceremonial takes place here weekly; the image of Parvati, the goddess of beauty and wife of Shiva, is carried in a golden palanquin in procession through the corridors past these statues to her shrine, and the faithful Hindus hang garlands of white flowers on these statues, and make offerings of betel-nut, in honour of the passing goddess.

This Temple possesses three "Tirthams" or sacred bathing tanks. The waters are believed to bestow special blessings: thus, one assures heaven to the faithful pilgrim, another

frees from sin, and the third absolves from the dread consequences of a curse. Devout pilgrims, therefore, anxious to derive all the benefit possible, bathe themselves in each tank in turn before leaving the temple. In the case of the Mahara Tirtham, the largest of the tanks, the sloping granite sides are cut into 22 steps, which have, through the lapse of time, become rather broken. The tank is surrounded by a pillared mandapam, and behind it is the domed tower of an ancient shrine. Beyond that is the Gopuram over the western entrance to the temple. Thousands of pilgrims come from all parts of India to bathe, worship, and make offerings at this Rameswaram temple.

A journey of 140 miles northwards brings us to the famous temple at Madura. A temple existed in Madura from very early times, but that early temple was destroyed by the Mahommedans in the 14th century. Later in the same century, in 1372, the Mahommedans were expelled, the priests of Shiva regained their revenues, and restored their mandapams and gopurams.

The east Gopuram through which we entered is one mass of carved and highly-wrought stonework, rising storey upon storey, in the true Dravidian style, to such a height that the eyes cannot take in the immense quantity of carved detail.

Before us is the "Pottamarai Kulam," or "Tank of the Golden Lilies," and marvellous powers are attributed to its waters.

This Madura temple is in two parts. The western part is dedicated to the god Shiva, and the eastern part to his consort, the "fish-eyed goddess" Minachi, a local goddess, though sometimes identified with Parvati, of whom we heard at Rameswaram.

At the east end of the tank the shrine of the goddess is entered through a court. The pillars of the court are sculptured with spirited figures, every alternate figure being a "Yali," the strange monster, which is the conventional lion of Southern India. Between the Yalis are the figures of the five Pandu princes who are supposed to have founded this temple about 1,000 years B.C. Only the first one can be clearly made out; he was Arjan, a famous archer, and carries his bow. A strange entrance this to the Holy of Holies, is it not. Yet to the Brahmins the shrine of the goddess is peculiarly sacred, and they call it "the twelfth place of

peace." This court is also called the "sacred Parrot Mandapam" from the number of parrots kept there, the offerings of devotees to the goddess. I found it to be the very reverse of a "place of peace," for the screeching of the parrots, the blowing of conch bells, and the banging of drums made a row which was almost unendurable. The whole effect was barbaric in the extreme.

We next visited the "Sahasrastambha Mandapam" or "Hall of a Thousand Pillars" in the Shiva portion of the temple. Eight steps, pointed in red and white stripes, lead up to the entrance. The steps are flanked by two large carved elephants below, and by two smaller ones above. To the left of the entrance, sitting on a rearing horse, is a figure of the builder of this hall, one Arya Nayaza Mudalier, prime minister of the then reigning prince about the year 1560. The next pillar has a figure of Shiva, as a warrior. The third pillar has a mythical, or allegorical, figure of a dancer trampling on death. No two pillars are alike; figures, flowers, spirals, &c., with a profusion of carved detail. The bracket capitals are ornamented with birds, and above them wide-mouthed "yalis." The whole interior of the temple is one mass of carving, and one authority asserts that "the sculptures of Madura are the finest in India." In the case of another pillar with the sculpture on a very large scale, the principal figure is the god Shiva in the attitude of dancing, his right foot is trampling on a demon, and his left foot on the head of a cobra. His wife, the goddess Parvati, stands behind him; below Shiva is his bull Nandi beating a drum. Nandi is represented with a bull's head and a human body.

Sculpture was evidently an advanced art in India several hundred years ago, but the artists of that period exercised the peculiar practice of emphasizing the principal figure in a group by making it of much larger size than the secondary figures.

A journey of 96 miles brings us to the famous rock of Trichinopoly. Devotees of the shrine on its summit believe this rock to be a splinter from the mythical Mount Meru, blown here by the divine breath of Brahma, the supreme god.

The rock fortress of Trichinopoly has played an important part in history from very early Dravidian times. Prior to the Christian era, the Chola Kings, a non-Aryan dynasty, established their kingdom here. Through the ages down to recent

times, Trichinopoly has seen much fighting, notably for us in the 18th century, when Lawrence and Clive finally established British authority here. The house in which Lord Clive lived is still pointed out in a row of buildings with arched roofs, said to be old bomb-proof barracks. The rock rises 273 feet above the level of the surrounding streets. At the summit is a temple to the elephant-headed god, Ganesha, son of Shiva and the goddess Parvati.

Near the foot of the rock is the Teppakulam, a large masonry tank or reservoir, a parallelogram in shape, in the centre of which a small but graceful pavilion has been built. This tank is the work of Visvanatha, a king who ruled here in 1559.

Although the rock is no longer fortified, this part of Trichinopoly is called the "Fort" to distinguish it from the Cantonment, a mile or so further south. In the Cantonment Europeans reside, while here in the fort are the homes of the native population, amounting to some 105,000 souls, among whom are numerous skilful workers in brass, also silver and gold smiths, nor must we forget the makers of the world-famous "Trichi" cigars. It is interesting to note that Bishop Heber, author of the hymn "From Greenland's icy mountains," died and was buried here in 1826.

Two and a half miles north of Trichinopoly, in the River Cauvery, is the island of Sri Rangam. On that island is situated the largest temple in Southern India, the outermost walls enclosing an area of 1,024 yards by 840 yards. So large an area does this temple occupy, that a portion of the houses of the town are actually erected inside the temple walls, causing the effect, when viewed from a distance, that towers and gopurams appear to be isolated and independent buildings, instead of part of one homogeneous whole.

Fergusson remarks: "Had the four great outer Gopurams formed the sides of a central hall, or court, and the others gone on diminishing in three or four directions to the exterior, the effect of the whole would have been increased to a surprising degree." The Dravidians, however, do not appear to have had it in them to think of such things.

The Sri Rangam temple is surrounded by three outer walls, each of them pierced by a Gopuram gateway. In the space between the outer and middle wall native houses are built, and this space is practically "a bazaar filled with shops,

where pilgrims are lodged, fed, and fleeced" (Fergusson). Passing through the intermediate Gopuram we are confronted with the great east inner Gopuram of Sri Rangam. On either side of the windows, all the way up, are carved figures of the god Vishnu, in his earthly incarnations as Rama. An authority, Dr. Burnell, has expressed the opinion that this, and the other large Gopurams of this temple, were built by Krishnaraya (1509-1530) to serve as fortifications to protect the shrine from foreign invasion. When attacked, the Hindu idea was, not to safeguard the women and children, but to defend the Brahmins and sanctuaries at all costs.

Through that great Gopuram we enter Seshagiri Rao's Mandapam, a courtyard, the pillars of which display the finest carving in the temple. Each pillar is cut from a single block of granite, and represents superb groups of warriors mounted on rearing horses, trampling men, tigers, and elephants under foot. Some of the pillars represent the nine various incarnations of the god Vishnu. One cannot help wondering at, and admiring, the fertile brain of the sculptor who designed this lavish and varied mass of carving.

Facing these splendid pillars is the Hall of 1,000 Columns, which measures some 500 feet by 138. Each column is a single block of granite, and all are carved more or less elaborately. Now-a-days, there are 953 columns only. This Hall is the Durbar Hall of the deity, whose annual festival takes place in December and January.

The Hindus have a legend that: "Those who visit Sri Rangam, those who remain there even for a few seconds, and those who only see the place, will not alone be saved from hell, the abode of Yama god of death, but will be free from disease and agony at the time of death, and will be preserved from a death untimely."

Leaving Trichinopoly, and journeying 55 miles in a north-easterly direction, we arrive at Kumbakonum, capital of the Chola dynasty of Dravidians, as far back as the 7th century. To-day it is a fairly bustling town of 65,000 inhabitants. The chief industry of the people is the manufacture of brass, bronze, copper and lead vessels; and there is also an insignificant amount of silk and cotton weaving and dyeing. The house roofs project beyond the fronts of the houses, thus affording shade and protection from the heat of the Indian sun to the people who sit under them. Under one

of the projecting thatches on the opposite side of the street to the temple, we saw a Yogi, or Holy man. He was a Brahmin, and had prominently displayed upon his forehead and his arms his white caste marks. He remains on his raised board all day long, praying to his Hindu gods, his eyes tightly closed, wholly indifferent to, and taking no notice of the sights, sounds, and passing events in the streets before him. The passers-by in the street, of their piety and charity, place money or food in the cloth at his side; on this he subsists, and if there be any surplus, he will probably give it to the temple, or to the idol of his tutelary deity.

Opposite to this Yogi was a sacred tank known as the Potamarai Tank, with a mandapam in the middle, and a temple beyond. It is known as the Sarangapani Swami Temple, and is dedicated to Vishnu the Preserver. The temple possesses five smaller and one enormous gopuram, 147 feet high, at the main entrance.

A story is told of one of these Yogis, who had a great reputation for austerity and sanctity, that he had made a vow not to eat any food on any day in which he did not receive more than ten rupees in offerings. "An impossible sum!" thought all the people. "But what a saint he must be to make so hard and severe a vow!" Sooner than let so holy a Yogi die of starvation, the poorest person was ready to venture any sacrifice, money came pouring in, rich and pious Hindus gave a thousand rupees and more at a time. In this way the Brahmin beggar, who existed miserably, without clothes and almost without food, was enabled to present to his god jewels, one alone of which is valued at 70,000 rupees.

Here at Kumbakonum is the famous Mahamakham Tank, which I can best describe as a four-sided lake, about 20 acres in area. It has flights of steps on each of the four sides, and has 16 small, but picturesque pagodas, or shrines, placed at regular intervals on the four sides.

Every 12 years the celebrated Mahamakham festival is held. The faithful believe that once in every 12 years the holy Ganges water finds its way through hundreds of miles of land into this Mahamakham Tank. If the moon is at full, when the planet Jupiter comes into conjunction with Leo, they believe that to be an exceptionally auspicious time for bathing, and tens of thousands of pilgrims from all parts of

India come to Kumbakonum to be purified from their sins in the sacred water. The last festival was in 1909.

The crowd in the tank becomes so dense that nothing is visible. When the gods are exhibited the worshippers raise their hands in prayer and dip their heads beneath the surface of the water, and I am told that the spectacle is decidedly impressive. Soon after the festival commences, the water is transformed by the mud stirred up from the bottom into a black viscous fluid of the consistency of thick pea-soup, and it can be nothing but intense religious devotion which induces the pilgrims to submerge their heads in the thick oily sludge.

A Government College was established here about fifty years ago. This college has long maintained a high reputation for efficiency, and many of the most highly educated Indians of the South have studied here. Indeed, Kumbakonum came to be regarded as the Oxford or Cambridge of Southern India. I am told that now-a-days there is a growing tendency on the part of students to prefer the colleges of Madras, 200 miles distant.

A short journey for India—only 42 miles—now brings us to the town of Chidambaram, a name which signifies “The Atmosphere of Wisdom.” The presence here of an ancient temple may have caused this romantic name to have been given to this place. Be that as it may, there is at this place, “Atmosphere of Wisdom,” an ancient temple which contains many gems of Dravidian art.

We first passed up an avenue of monolithic granite pillars, about 70 in number, which produced an effect of grandeur and of wonder—What are they for? Why are they here? If they were ever intended to support a building, or carry a roof, that intention was never carried out. At the end of this avenue of columns is the Râja Sabhâ, or Hall of 1,000 pillars. Entrance to this Hall is gained through a magnificent portico, the pillars of which are elaborately carved. The Hall beyond is similar in many respects to that at Sri Ranganam, but is rather more modern.

The temple elephants are stabled here, and you may frequently see one of those sacred beasts coming down the stone staircase, carrying an empty bucket with his trunk and returning presently with the bucket full of water; he does this both for his own use and for the temple requirements.

The wall below the pillars is covered with carving, which

is probably from 400 to 500 years old, and one piece we noticed was of an elephant and his keeper. The elephant is employed as a symbol of majesty and power, and this is evidently what it was meant to typify here, for the elephant was on a much larger scale than the man moving before him. The carving has been a good deal knocked about and damaged, but that is not surprising when you remember that 150 years ago Hyder Ali, the Mahommedan Sultan of Mysore, placed a garrison of some 3,000 men in this temple, and held it for some time against the British. I suppose that a certain modern "Kultur," of which we have heard much lately, would not have left one stone on another; but I am glad to say that that kind of "Kultur" had not arrived, and much has been left to us at this place.

The Chidabaram temple is dedicated to the god Shiva, and his Nandi Bull can be seen at intervals on the roof of the cloister or colonade, also, the cupola of the shrine is carried on the backs of Nandi bulls. This temple is surrounded on all sides by a strong wall, which is pierced at each of the cardinal points of the compass by a gopuram.

I referred a moment ago to Hyder Ali, who was a soldier of fortune in the army of the King of Mysore. Owing largely to his exploits, Mysore became more and more powerful. By unscrupulous methods Hyder Ali gained authority in the kingdom, until in 1761 he usurped the throne of Mysore. For the next 38 years he and his son Tippu Sultan were thorns in the side of the British.

War, fighting, peace, intrigue, more fighting; it was a struggle, practically, who should be masters of Southern India.

The prominent building with the gilded summit on its dome-like structure, seen on approaching Mysore, is the Rajah's Palace. In the palace is an open gallery or hall, in which on state occasions the Maharajah shows himself to his people, seated on his throne. The present Maharajah is go-ahead and progressive. He is one of the great Indian princes who has sent a force of his soldiers to assist us in the present war.

The city of Mysore has a population of 68,000 people; it has good broad streets, sanitation has received great attention, and altogether the town has a neat and thriving appearance.

Two miles south-west of the city the Chamundi Hill rises



E.W.M

Fig. 5. In the Temple of Chidambaram.



E.W.M.

Fig. 6. Rock Carving at Mahabalipuram. "The Penance of Arjuna."

3,489 feet above sea level. After climbing two-thirds of the way up, we suddenly find on the hill-side a colossal figure of Nandi, the sacred bull of the god Shiva, hewn out of the solid black rock. Though in a recumbent attitude the bull is 16 feet high. This Nandi bull was carved by order of Dodda Deva Raja, who ascended the throne of Mysore in 1659. The carving represents the Bull as wearing the gold or silver bells of his state trappings. On the platform erected round the bull is placed a table, or altar, on which the devout Shivites lay their offerings of flowers. The Nandi represents the Shiva god in one of his forms, or incarnations, and is therefore very sacred to the Shivites.

The names of Hyder Ali, and Tippu Sultan, especially the latter, are perhaps to English people more intimately connected with Seringapatam than with Mysore, for British blood has been spilt at Seringapatam. Tippu provoked war with us, and fortified himself and his army in Seringapatam, where he was besieged by Lord Cornwallis in 1791. After nearly a year's fighting Tippu Sultan surrendered, and terms were arranged, but Tippu soon began to intrigue, and again upset the peace which had lasted seven years. In 1799 the British forces again besieged Seringapatam, and at the final assault Tippu Sultan was killed. This siege is of great interest to us, from the fact that the British reserve troops were commanded by Colonel Arthur Wellesley, afterwards the great Duke of Wellington.

The name of this place, Seringapatam, is derived from a temple of Vishnu, as a localized deity, Sri Rangan, of great antiquity and celebrity. The innermost shrine of this temple contains an image of Sri Rangan, reclining on Adi Sesha, the King of Serpents. Hence you get the three-fold name, Sree-Ranga-Patna, which became abbreviated into Seringapatam. This temple is of nothing like the size, nor interior ornament, of those already mentioned, but it is interesting from its venerable antiquity. It is believed to date originally from the year 894, more than a thousand years ago, and it was enlarged in 1454, nearly five hundred years ago.

The Gopuram of this temple is not so lofty as those which have been described, but it contains an immense wealth of architectural detail. In many of its numerous nooks and corners are placed, as if in niches, images of different Hindu deities. The five pinnacles on the top of the Gopuram were

gilded by a recent Maharajah of Mysore at a cost of 5,000 rupees. Over the entrance door is slung a garland of mango leaves placed there by the devout.

All these temples possess a festival or triumphal car, in which, on the great annual festival, the image of the god is dragged in procession through the town. The festival car of this temple was a strange looking object, being a heavy ponderous waggon built of teak, with great wheels, seven or eight feet high, formed of solid rounds of wood, studded with enormous iron nails. Massive iron rings are affixed to the fore part of the car, and to these rings are attached stout ropes by which the car is hauled along.

On the car is built up a lofty skeleton Pavilion, which is hung with gay hangings and trappings, the whole forming a canopy, or baldachino, under which, high above the heads of the people, the god is enthroned. This god was a kind of winged creature, painted in gay and garish colours; he has the caste mark of Vishnu, the preserver, on his forehead. Evidently he is intended to represent Vishnu-Sri-Rangam, from whom Seringapatam is named. The great chief image of the god is a fixture in his shrine in the temple; that carried in the car may be said to be his travelling counterpart, or double.

At the annual festival this image is lifted by means of bamboo poles into the pavilion on the great car. The ropes are grasped by seven or eight hundred worshippers, men fighting to get hold. The ponderous car is then slowly dragged along with much creaking and groaning of the timber. Those devotees, who could not grasp a rope, cast offerings of flowers, pumpkins, and so forth, in front of the car, to be crushed beneath its heavy wheels.

The procession over, the god is returned to his shed, where he rests with the dust and the bats, until his next holy procession becomes due.

The ascent of the Nilgiri mountains is made by a mountain rack railway. The name Nilgiri signifies "Blue mountains," and the name seemed amply justified by the blueness of the mountain peaks, such as the Hullikul Droog, which rises 7,000 feet above sea level, and others rising over 8,000 feet.

As to the geological formation of the Nilgiris the Text-book tells us scientifically that it consists of "a great mass of

the charnockite series of hypersthene-bearing granulites, with a few later dykes of olivine norites," also that "typical Archæan biotite and hornblendic gneisses with intrusive bands of charnockite and much younger biotite-granite pegamite and basic dykes make their appearance."

Suffice it to say, that the rocks and the soil have a pink to red appearance, rather reminding one of Devonshire soil.

The metre-gauge rack railway rises very steeply, the ruling gradient being 1 in 12. The scenery is grand, as the railway passes through dense jungle, and forests of bamboo, acacia, black-wood, and teak. As we rise we gradually leave below us the tropical growths, and at the level of 6,000 feet we find cultivated quinine-yielding cinchona, eucalyptus, coffee and tea plantations, and approach the little mountain town of Coonoor. It is a pleasantly-situated little place in a hollow, or cleft, in the mountains, which rise steeply on either side.

A little river, the Jalkattalla, flows down through the town, and through the ravine, more or less parallel with the railway, all the way down to the plains, some 6,000 feet below.

We visited the market or bazaar, and noticed that at the entrance the oxen were unyoked from their carts, while their owners were engaged disposing of their produce in the bazaar. At one part of the bazaar we saw prominently displayed kerosene oil tins, and, near by, piles of brass and copper chatties, or water jars. It is the practice of the cooks and housekeepers of all the surrounding bungalows to come to this bazaar in the early morning, to buy in their necessities; meat, vegetables, and so forth, and a good long walk it is for many of them, down the hill and up again.

We stayed at a tea planter's bungalow, which had chimneys, as fires are necessary at this altitude in the cool weather. One can scarcely speak of it as winter, as there is no frost here, though occasional hail showers. The bungalow was situated on the crest of a hill, and the ground fell away from the house, affording a nice stretch of flower garden. The tea plantation is mainly behind the bungalow.

Coonoor is a recognized hill station, where in hot weather the gasping and jaded Europeans come from the sweltering plains below for coolness and recuperation. It is a healthy place, and the death-rate is remarkably low.

We visited my friend's tea estate, and noticed the careful and regular lines in which the tea bushes are planted. The

growing tea looks bright, fresh, and luxuriant; this is due to the rainfall; down in the plains all is dry, arid, and crying out for water, but up here in the Nilgiri Hills there is an average rainfall of 63 inches, distributed in normal years over 91 days.

The planter decides with the headman when the leaves in a particular section of the estate are ready for picking. The pickers are then brought to that section, and each bush is thoroughly picked. The women pick leaf by leaf with the right hand, until they have that hand full; the leaves are then deposited in the large circular baskets which they carry in the left hand.

The tea is grown here for quality rather than for quantity. It has a fine delicate flavour, more like a China quality than the rougher flavour of the tea grown further north, Assam for instance. Once picked, the tea must never be allowed to get wet; therefore, if a shower threatens, the women rush off with their baskets to the drying house. When brought into the drying house, the leaves are first placed in a rolling press, which squeezes out the sap and rolls them into the shape familiar to us all; the leaves are then placed in huge racks to thoroughly dry, and are finally graded, according to quality and size, into their various assortments, which in this particular estate are known as Pekoe, Orange Pekoe, Souchong and Coujou. All this sounds simple enough, but extreme care, cleanliness, and judgment have to be exercised all the time, or a whole picking may be damaged and the selling value lost.

Not only after picking is care necessary, but during the whole of its life the tea plant requires constant attention, therefore on all tea plantations there is a small regiment of men, who plant, prune, hoe, weed, and clear away insects. They work contentedly for a few annas a day, an anna being worth a penny. Their wants are few; some rice seems to suffice for their food, and they never are seen to wear shoes.

But at Coonoor other things grow as well as tea. There is a luxuriance of all sub-tropical plant life. In sequestered spots, especially if a little runnell should ripple along, magnificent tree-ferns are to be seen, and very agreeable and restful to the eye these masses of green were, after the dry, parched plain country. The height of one fine specimen we saw from the ground to the top of the uppermost frond was

fully 20 feet. Birds of brilliant plumage circled round, and butterflies of all hues flitted from leaf to leaf, so that altogether it seemed to be enchanted ground for the nature lover.

After travelling another eleven miles, and rising another thousand feet, the railway crosses a lake by a girder bridge, carried on white stone pillars, and terminates in the mountain town of Ootacamund, a name derived from *mand*, a Toda word for a collection of huts, or village, of *Utaka*.

A man named Buchanan was the first Englishman to find his way up here in the year 1800. Eighteen years later Messrs. Kindersley and Whish, of the Civil Service, came up here on a shooting expedition, and it was their account of the coolness and pleasantness of the climate which first drew attention to the Nilgiri Hills as a sanatorium.

Now-a-days, Ootacamund is the chief sanatorium, the chief hill station in Southern India. In the hot season the Headquarters of the Madras Government are moved to this town, or "Ooty" as it is more familiarly called by the British people quartered here.

The approach to the town by road proceeds along the bank under the shade of the trees at the eastern end of the lake already referred to; this bank is known as the Willow Bund, and is the subject for the usual or conventional picture of Ooty.

Ootacamund reposes in an amphitheatre, surrounded by four great hills of the Nilgiri range, each of them more than 8,000 feet above the sea. On the lower slopes of these are situated the houses and official quarters, which comprise the town of Ootacamund. It is a hill station of great charm, and plants and shrubs, which require shelter in England, grow luxuriantly here in a wild state. Garden hedges consist of roses, geraniums, fuchsias, and heliotrope. In the cold months the frosts are so slight that flowers bloom in profusion all the year round.

Passing beyond the town, and passing beyond the dwellings of civilized man, we ascend to where the rolling mountain tops meet the storm cloud. In this region there is not a square mile of level ground. In the wrinkles of the hills, however, nestle small but beautiful woods, known as "Sholas."

And there, screened by the sholas, far from the haunts of men, it is that we must look for the Todas, that strange

aboriginal tribe to which I have already referred, and of which so small a vestige is now left.

Making our way through one of these mountain sholas, we come upon a Toda "Mand," mand being the name of a permanent village or encampment. These primitive Todas are a purely pastoral race; the herding of buffaloes is their only occupation, and so primitive are they that they have no weapons nor means of defence. The Government, however, has secured to them the enjoyment of their mands free from interference, and a certain area of land has been allotted to each mand for the grazing of their cattle.

The Mand consists of a few wooden huts, thatched with dried grass and bamboo fastened with split rattan; all interstices and holes in the boards are filled in with clay mixed with cow dung. Entrance is gained by a small doorway, to pass through which would necessitate our stooping down on our hands and knees. It rather suggests the entrance to a dog kennel. This doorway is the only passage for light, air, and smoke, as well as for the family.

These Todas have no religion, as we understand it, nor as the neighbouring Hindus understand and practise it. They do, however, hold light as opposed to darkness in great reverence: thus, in the morning and in the evening, a Toda will salaam to the rising and setting sun, and they have a formula of prayer which they address to the full moon. It is a somewhat impressive sight to see one of these men, surrounded by his family, stand forth in the bright moonlight, with his hand to his forehead, and cry out to the moon in his Dravidian tongue:—"Danenma, mokh ultama, âl ultama, êr ultama, karr ultama, ellam ultama," which being interpreted is:—"May it be well with the male children, the men, the cows, and the female calves." And here you have the clue and essence of Toda religious feeling.

The buffalo cow is a sacred animal, and her milk is a sacred fluid, too sacred for the ordinary Toda, who is merely a herdman, to touch. A special milkman—pâl karpâl—is appointed. His is a sacred office; he takes the milk of the herd to the pâltchi, or mand dairy, a sacred building venerated as a temple. The pâltchi is usually built into the hill for coolness sake, and is enclosed in its own separate wall. In the pâltchi is stored the pâl, or milk, to be subsequently con-

verted into the clarified butter, known as "Ghi," an article of commerce.

The Todas have always been endogamous; by that is meant that it has always been their custom to unite in wedlock solely within their own community, and thus their primeval characteristics have been propagated down to the present day. Anthropologists say that they are dolichocephalic, as against the modern brachy-cephalic: *i.e.*, these people exhibit the long narrow skull approaching that of primitive man, as against the shorter, rounder skull, with high cranium of modern civilised races.

The Todas are a fairly well-grown race, straight and lank, but without any really fine people; the men are erect and free, without being athletic, and they are quiet and solemn. The women are more cheerful than solemn, and their expression and carriage has much oriental repose about it. The hair of both sexes is black and heavy, wavy rather than curly. The dress of both sexes is identical, over a loin cloth is worn a toga, or mantle, of coarse unbleached cotton; it measures about two yards by a yard and a half, and is ornamented at the ends with blue or red stripes. It is worn double, and envelops their bodies completely. A cumbersome garment to wear, better suited for sitting and sleeping in than for any purpose of work, but then you cannot class these people as workers.

Another strange custom practised by the Todas is that of polyandry, *i.e.*, a woman may have more than one husband. The practice of polyandry no doubt commenced in remote ages, and continued down the centuries. It is the direct result of the barbarous habit of girl infanticide, which the Todas practised, but which the Government has now stopped. In primitive times, when the males had to hunt and fight for food, only boy children were allowed to mature in order to continue the struggle. Statistics show that one girl was the average allowed to each family, and additional girl babies were destroyed.

Soon there was a shortage of Toda women; there were not enough to go round; then the women began to take more than one husband, and thus grew the custom of polyandry. Even now, I believe, although 50 years or more have elapsed since our Government stopped girl infanticide, there are only some 75 Toda women for every 100 men. It is interesting to

have seen these people in their haunt, but I cannot help feeling that, owing to isolation and degeneration, they are in process of time doomed to become extinct.

Having seen a primitive tribe of Dravidians, it is fitting that we should visit the earliest known example of Dravidian architecture. To do this we must descend the Nilgiri Hills, return to the plains and travel by the South Indian Railway for about 300 miles, arriving at length at a place called Mahabalipuram.

We pause before a rock, the whole face of which is a huge bas-relief carving 90 feet by 30 feet. It depicts the penance of a hero named Arjuna, and shows him standing on one leg, with his hands above his head, doing penance. So wide was his influence that all creation came to do penance with Arjuna; not only his attendants and servants, but also elephants, lions, tigers, deer, apes, cats, rats, birds, all came to do penance with Arjuna. Prominent in the centre is Naga, the serpent god, with his seven-headed-cobra-hood; below him is his daughter Ulipi, with three snakes over her head. Altogether it is a wonderful piece of rock sculpture, and well repays close study.

Moving on a few yards we come to three of what are called the "Seven Pagodas." The extraordinary thing about them is that they are hewn from solid rock, they are monoliths, one and the same stone. They date from the 6th and 7th centuries, before Dravidian architects began to build, they are called Rathes, and "Rath" signifies "a car" or "chariot."

The third or furthest Rath is known as Arjuna's Rath, we have just seen Arjuna's Penance. This Rath is a copy in smaller size of the first or nearest Rath. Arjuna's Rath is badly cracked. The second, Bhîma's Rath, has a curvilinear shaped roof, and is 25 feet high, 25 feet wide, and nearly 48 feet long; externally it has been completely carved, but internally it is only partially excavated. It is cracked completely through, so that daylight can be seen through. The cracks in this and in Arjuna's Rath have been attributed to earthquake; but Fergusson says that the real cause is that the sculptors attempted to excavate the interior, in order to make it resemble a structural building with a wooden roof, but the superincumbent weight of solid rock above began to crush through and so cracked the Rathes.

The first or nearest Rath, Dharmarajah's Rath, is the finest and most interesting of the group. It is 35 feet high, and the three upper storeys are ornamented with a series of imitation dormer windows, each with a human head looking out. The pillars are carved lions, and in the recesses are Hindu deities.

A cell has been excavated in the second and third storeys to the depths of four and five feet respectively, but the first floor still remains solid rock.

Further on is Sahadeva's Rath, and by it an elephant, both carved from the solid rock. The elephant is, as I have already mentioned, a symbol of majesty and power. This Rath is 16 feet high, and is ornamented in a similar manner to Dharmarajah's Rath; but the special feature of Sahadeva's Rath is a projecting portico, and this peculiar feature induces the belief that this Rath was intended as a Chaitya, or Assembly Hall, in which the devout could worship. One wonders if there were many people to worship here, 1,500 years ago, for to-day this is a remote, desolate spot, difficult of access. These Rathes are wonderful specimens of rock carving, 1,400 to 1,500 years old.

About a mile from the Rathes there stands the ruin of the oldest Dravidian built temple known. This temple dates from the 9th century, and all that is now left of it are two shrines. The smaller shrine is dedicated to Vishnu, the Preserver; and the larger shrine to Shiva, the Destroyer and Reproducer. The wall of the courtyard is ornamented with a series of Nandi Bulls of a different coloured stone. Formerly considerably more temple buildings stood in this courtyard, but they are now all gone, only the foundation stones remain.

Standing as it does on a point of land which juts out into the sea, this temple has suffered much from high tides, sea air, and wind. The sea actually washes the eastern wall of the Shiva temple, and the spray from the surf is carried over the temple buildings. The waves break over some of the great stones of this temple, and over a Dhīpastamba, *i.e.*, a lamp pillar, such as is found in all Pagodas. The situation of the temple on the edge of the sea is no doubt very romantic, but it would be a thousand pities if it were to crumble away, being as it is the earliest and purest style of Dravidian architecture.

And now we bid farewell to Southern India and her Dravidian Architecture. I am sure that you will agree with me that the architecture which I have described displays exuberance of fancy, lavishness of labour, and elaboration of detail to an extraordinary degree. The brains, the eyes, and the hands that can execute such works as these are capable of great things. Their descendants are our fellow subjects to-day, and I believe that under a just and wise British Government, they will rise to a still more resplendent glory.

REVIEW.

“Economic Geography.” By John McFarlane, M.A., M.Com., Lecturer in Geography in the University of Manchester. Maps. London: Sir Isaac Pitman and Sons. (Price, 7/6 net.)

Mr. McFarlane has accomplished the difficult task of producing an economic geography that can be read by non-geographers.

The business man is quite willing to read books on geography, but does not want to have to retire to a secluded room and weigh the pros and cons of this and that theory and then find disputable—and meant to be disputable—conclusions. He wants a clear idea of the purposes of the book in brief and then a fund of information useful to himself and his kind. He recognises that geography follows along immoveable lines within moveable environments. He sees that the prospector, the botanist and even the German war meteorologist are geographical explorers, each tending to alter the face of the earth in different ways and at different places. He knows that geography is the enfolding and summarising science which gives him the knowledge of how, where and why the greatest profit can be made by the skilful application of the other sciences in the economic development of the known world. He is aware that geography gives him the location of facts on which to project his business plans.

Mr. McFarlane has given him three chapters in which to think, and he loves to think, say, through three chapters, and then comes the application—the places where people make and lose money—and here he gets full detail of the economic conditions and the resources, developed and undeveloped, of the various political portions of the globe.

Mr. McFarlane is to be congratulated on a book which will suit the geographer, the business man and the student. There are one or two points which might have been touched on more deeply, and I might mention especially cotton, but I expect that the author has intentionally dealt lightly with this subject and will surprise us soon with a thesis on the geography of cotton, a subject which would surely give a basis for a series of lectures before our own Society.

J. H. B.

SIBERIA AND SOME SIBERIANS.

By MISS M. A. CZAPLICKA, F.R.A.I.

(Addressed to a Joint Meeting of the University and the Society, in the Whitworth Hall, on Tuesday, January 11th, 1916).

I left England in the latter part of May, 1914, on my expedition to the Lower Yenisei, under the auspices of the Oxford School of Anthropology, and as Mary Ewart Travelling Scholar of Somerville College, and was joined in Moscow by Miss Curtis, an artist, Miss Haviland, a specialist on birds, and Mr. Hall, representing the University Museum of Philadelphia.

From Moscow we went by rail to Krasnoyarsk, where the Trans-Siberian Railway crosses the Yenisei. We reached Krasnoyarsk late at night on the 7th June, and the steamer was timed to leave at noon on the 8th.

Mr. Christensen, the extremely courteous, able, and obliging Krasnoyarsk manager of the Siberian Steamship Trading and Manufacturing Company, an Anglo-Norwegian-Russian concern, had laid in a stock of provisions for us. Mr. Christensen had had some difficulty in complying with my telegraphic request to engage an "honest and sober" Siberian man-servant for us, since in summer the demand for good labour exceeds the supply. However, he had at last succeeded in finding a blameless "specialist in musical instruments," as the man described himself, who fulfilled the two requirements insisted upon, though, as we discovered later, at the expense of most other qualities necessary in a man-of-all-work such as we required.

Then there were arrangements to be made for getting permission to carry pistols—for Mr. Christensen would not hear of our leaving civilisation unarmed—and the pistols themselves to be purchased, besides the addition to our stores which we had agreed upon with our indefatigable agent. But for him, we should never have accomplished the half of what had to be done in the swift, crowded hours of that morning.

About noon we embarked on the Oryol, formerly the Glenmore, a not very large paddle-wheel steamboat, which, a good

many years ago, used to carry passengers on the Clyde. Now she carries fishermen and a few traders to the fishing stations along the lower course of the Yenisei. She had in tow two barges laden principally with empty barrels. These she would call for on her second voyage at the end of the fishing season, and take them back full of salted fish. The passengers were a rough lot, though sufficiently polite when sober, and offered excellent material for ethnological study in the variety of Eurasian mixtures they represented. But it was the real native I was impatient to see, and we had still nearly 800 versts to go before we could hope to meet him, in the person of Yenisei-Ostyak and Tungus, at Vorogovo.

This place, which is dignified, somewhat boastfully, by the name of "village"—Syelo Vorogovo—marks the frontier of the river, south of which the natives do not usually pass. From here northwards whenever the "Oryol" stopped to put ashore barrels or pick up fisherfolk, we went ashore to talk with the Russian settlers or to measure and photograph natives, and make notes about them.

The Russians living north of Krasnoyarsk consist of descendants of the criminal exiles almost exclusively, for the political exiles and free settlers are met with more usually in Southern Siberia.

Near Verkhne-Imbatskoye, 324 versts north of Vorogovo, the river is so wide that when we approached a landing, the opposite bank appeared as a dim, green line low down on the horizon. Here the banks retained fairly frequent patches of last winter's snow, and at Turukhansk, still some hundred versts south of the Arctic Circle, people had come down on sledges to the river to meet the steamer. They had never seen any foreign women here, and there were many conjectures as to the object of our visit. As far as I could make out, there were three leading theories: the first was that we were spies sent to investigate the possibilities of the Yenisei as a military route, and the outcome of our journey would be "ships bringing war through the Kara Sea." This notion was scouted by those who were better versed in the later developments of European politics before the war; they maintained that the English Government had sent three suffragettes into perpetual exile in Siberia by special permission of the Czar. But perhaps the most widely accepted opinion was that we were foreign traders, who had come to look into the

business possibilities of the Yenisei country. Indeed our passage was a great event in the humdrum lives of these Sibirians, and awoke the still fresh memories of the passing of Dr. Nansen, who had gone up the river from the Kara Sea in the previous summer.

At Christovo we met one Ivanoff, a trader, who has grown rich by his dealings with the native Yurak. Unlike most of his colleagues on the river, he has far more than a mere superficial knowledge of the exterior, so to speak, of native life and customs. He knows and understands them so well that he passes among them for a notable shaman, or medicine man, to whom they resort for healing and other shamanist ministrations, as freely as if he were a native medicine man. Needless to say, this is to him a valuable part of his equipment as a business man, and the other traders cannot begin to compete with him in this district.

Golchikha, the most northerly point at which the "Oryol" touched, and 2,440 versts by river from Krasnoyarsk, is the name applied not only to the right tributary of the Yenisei, which joins that stream here, in lat. $71^{\circ} 43' N.$, by two mouths, but also to the marshy island between these mouths and the land bordering the confluence of the streams. Immediately to the north of this point, the Yenisei widens out into the great estuary and bay by which it flows into the Arctic Ocean. During the three weeks in which we had been crawling down stream, we had, as I have said, taken advantage of the frequent stops to see what we could of the wild and desolate country. Now we were to spend what remained of the summer in what is perhaps the wildest and windiest part of it—the Big Low Tundra, as the natives call it.

It was a damp, blowy day when we landed, and the ship's boat had no difficulty in making its way through the ice-floes to the muddy shore, which was covered to within a few feet of the water's edge with deep, wet snow. The natives were only just beginning to come in from the tundra; a few of their *chums*, or tents, were vaguely outlined against the bleak, grey sky on the mainland across the fork of the Golchikha.

This little settlement was our headquarters, where we had our log hut, keeping our tent for travelling. From here we made expeditions of varying lengths up and down and across the river, and into the rolling tundra country behind the flat foreshore. The short, vivid summer passed only too quickly

away, with its perpetual daylight, the short-lived splendour of purple, red and yellow wild flowers with which it carpeted the hills, the not less varied and picturesque nomads appearing out of a misty nowhere, disappearing again into the vague limbo beyond the low horizon, like the migrant birds.

While our ornithologist was busy observing, photographing, and collecting birds, and our artist victimising models—and herself, for a sitting of one or two hours often involved entertaining the sitters for the greater part of a day, Mr. Hall and myself worked on the natives, measuring them and getting notes on their social anthropology, folklore, etc.

Occasionally we made expeditions to some Yurak and Samoyed tombs near Golchikha, while once we tramped some sixty versts to the tomb of a mammoth in the tundra, only to find that nothing remained of him—except two or three teeth, and a few fragments of leg bones.

We studied chiefly the Yurak, a Samoyedic tribe from the tundra on the left bank of the Yenisei. There are some works on other groups of Samoyed, but little or nothing has been written about the Yurak. I have made some study of their language, which is very difficult, and I did not master it to anything like the extent I did Tungus during the winter.

There were also Samoyed from the tundra east of the river, belonging to the Khantaisk, Avamsk, and Karasinsk local groups. From the eastern tundra came also some Dolgan, a tribe of Yakutised Tungus.

While we did not have much difficulty in securing measurements, conversation and the collection of tales, with the help of a native interpreter, was still easier; but they were less approachable when it was a question of actually observing customs or shamanist ceremonies. Most risky of all was our exploration of the tombs scattered about the hills near Golchikha. We had to be very careful not to be observed, lest we should be taken for cannibals, or, still worse, as offering a deliberate offence to the spirits of their ancestors. On these occasions we had to get rid of even our Sibiriak servant, who shared to the full the superstitions which make up the religious beliefs of the Russian peasants in Siberia. He was sent off with a gun, and though these expeditions of his did not greatly replenish our larder, still they served to keep him out of the way for some hours at a time.

Our limited diet—though there was no lack of fish, and

we took our share of the flocks of migrating birds—the cold and damp of the mosquito-infested marshes we lived among, the dangers of travel in small boats on the stormy surface of the river—all hardships were more than compensated for by the interesting things we learned about the lives of the natives. This was their fishing season, when many of them come to the river to fish for themselves or for the Russian traders; but there were many days when the river was too rough for fishing, and their occasional excursions after geese did not occupy nearly the whole of their abundant leisure. So we were almost certain to find some one at home when we visited the *chums*, and we generally had our hut full of visitors when we were in.

As I have said, they are very communicative, and many hours passed in talk with old men about birth, death, marriage, the worship of good spirits, the struggle with bad ones—all this curiously schematised into a cycle of ceremonies, *rites de passage*, which mark the chief epochs of their simple lives. The recital of their tales and legends sometimes occupied many hours. The Yurak tell their tales in the first person; the story-teller represents a hero relating his own life and adventures. Some of them embody an account of rites and ceremonies.

All the peoples of the tundra reckon their riches in reindeer. Some of the Yurak and other Samoyed have very large herds; a rich man may own from five to ten thousand deer. As the animals soon eat up the moss in a given locality, the frequent changes of pasture make it necessary for their owners to have a very mobile form of dwelling. Hence all the tribes of the tundra, reindeer Nomads, are dwellers in tents. The *chum* is in shape and construction almost exactly like the wigwam of the North American Indian of the plains, and its skin covering and tent-poles can be easily and quickly packed on sledges for removal from one moss-pasture or hunting-ground to another.

There is usually one family to a *chum*, and its nearest neighbours may be anywhere from fifty to 500 versts away, at any given time. Sometimes a man whose herd is big enough to make him able to support three or four wives may have two or three *chums*, but this is unusual. Commonly one tent houses a whole family, however large. The closer the packing, the greater the warmth.

Reindeer do not require much attention, and, except in the dark months of mid-winter, hunting and trapping are diligently pursued. In the far northern tundra the principal game is wild reindeer; further south, on the borders of the forest, elk and mountain sheep are also hunted. In the southern tundra hunting is by individuals, while among the Samoyed and Yurak it is performed also by hunting parties, and is to that extent communal. Communal hunting is less common now that the use of flint-lock guns is becoming more widespread. The old method is not yet quite obsolete, however.

September 3rd closed the first chapter of our wanderings—a chapter which was, so to speak, a bright and sunny prologue to the longer story of our dark winter travel.

The summer was clearly at an end. Birds, flowers, and natives disappeared from the banks of the river with the first gales of autumn and the appearance of the steamers from the south, which had come to meet the little fleet of Kara Sea boats. Now we got our first news from Europe since the end of May—the first news of the war—all the more overwhelming from its very vagueness. For all our informants could tell us was that an Austrian archduke had been murdered, and that England, France, and Russia had been attacked by the Central Powers. Two of my companions, at any rate, would soon know more about it, for Miss Curtis and Miss Haviland were going back to Europe through the Kara Sea on the “*Ragna*,” of the Siberian Steamship Trading and Manufacturing Company, through the courtesy of Mr. Alfred Derry, the London Director of the Company, and Mr. Jonas Lied, the Managing Director. When I thought of the difficulties of the Northern sea route, enhanced now, no doubt, by the presence of German warships and mines, I could not tell whose was the greater risk—theirs, whose path lay westwards, or ours, whose way led eastwards through the blizzards of the frozen wastes.

We said good-bye to our companions at the Nosonovski Islands, the farthest point south to which sea-going steamers can go; for the channel above this spot is in some places too shallow for ships of any considerable draught.

Once more on the “*Oryol*,” with our old friend Captain Elo, a Finnish sailor, who knows the Yenisei as well as the palm of his hand, we went south, still more slowly than we



Fig. 1. Ostyak of the Yenisei.



Fig. 2. Group of Yurak Samoyed Men.

had come down the river, making more frequent and longer stops, and lying up every now and then, sometimes for a whole day, for fear of losing the barges in the autumn gales. So we were able to see more of the natives along the banks, besides those who came on board at almost every stop. We were more than two weeks in reaching Monastir-Turukhansk, which is 970 versts south of Golchikha, and about 140 versts south of the Arctic Circle. Here we should receive our post, forwarded from Krasnoyarsk, provisions for the winter, sent also from Krasnoyarsk by Mr. Christensen, supplement our stock of fur clothing, and make arrangements for sledges and reindeer for our winter journey.

The Dolgan, whom we encountered in the north, are Yakutised Tungus, not pure Tungus. Now we were to make for the interior of the tundra, between the Yenisei and the Lena, travelling north-eastward, across the Arctic Circle again, into the country of the real Tungus.

The few weeks of the short autumn before the river finally freezes over and the snow is deep enough for sledge travelling, we spent in Turukhansk. This is the season of the so-called "rasputitza"—"disorder," breaking up of communications—when the early ice alternately breaks up and reforms, making the river impassable for boats, and when there is not yet snow enough to allow of the use of sledges. The term is also applied to the similar condition of affairs in the spring.

We occupied ourselves with preparations for the winter journey, and I was fortunate enough to find in Turukhansk a Tungus woman, the widow of a Russian criminal exile, with whose help I supplemented my theoretical knowledge of the language. She also consented to take service with me as *dame de compagnie*, for the period of my travels among her people. She was an elderly lady, but active and lively, like all the Tungus, even when advanced in years. Through contact with her husband's associates she had lost all her native ideas of decency and morality, without acquiring any new ones from such Russians as her marriage had placed her among. But, in spite of all her faults, I was glad to have her with me, as her numerous relations included many of the most important people among the Tungus to whom we were going. She was known as my interpreter, but it was fortunate for me that I had learnt enough Tungus to be able to check her translations.

The route we chose lay along the Lower Tunguska, Sievernaya, Kureika, Kotui, and through the lake district to the Khatonga and Kheta. No Russian traders go this way. The population of the district through which we travelled is purely native and their contact with Russians is of the slightest.

We started as soon as sledge travel was practicable, some Tungus who had camped for the autumn about 80 versts from Turukhansk having brought in reindeer for us. At intervals of from 60 to 100 versts we hired teams for our sledges, and their owner as guide and driver. This was a better arrangement than buying reindeer for the whole journey, which would have involved very slow progress through the necessity of camping frequently to give the deer long rests. Such halts would also have had to be made at considerable distances from native camping places to avoid trouble through the mingling of our deer with other herds. By travelling as we did, we were able to spend the time between stages in the native chums or tents, which, of course, was just what we wished to do; and, in fact, we did not occupy our own tent for more than about three weeks altogether of the whole time we were in the tundra—and we covered a distance of something like 3,000 versts during the winter.

I need not dwell on the difficulties and discomforts of travelling in the winter darkness, and in a temperature which not infrequently fell to between -80° and -90° F., over the surface of frozen rivers and lakes, over mountain passes, and wide rocky plateaux, where the broken ground was often but partially covered with snow, so that the sledges progressed in a series of jerks and plunges, and packages were dropped, boxes broken open, half of our kerosene lost by leakage, and ourselves shaken and jolted about like helpless bags of bones. Our native drivers seemed to feel the cold hardly less severely than we did; but it was our photographic apparatus which was perhaps most affected, and we had many disappointments in this regard which must be ascribed as much to the cold as to the peculiar conditions of illumination.

The Tungus are cleaner than the Samoyed and Yurak, but not so clean as the Dolgan and Yakut. By this I do not mean to say that the morning tub is an institution in the tundra. The morning cup, however, is among the Tungus; and it is astonishing what results in the way of a "shining

morning face" can be got by the judicious and economical use of a cupful of cold water, when one has once realised that this is all that can be wheedled out of a careful tundra housewife.

The Tungus whom we visited belong chiefly to the Limpiisk territorial group, so called from the River Limp, a tributary of the Northern Tunguska. A straight line drawn from south-west to north-east from the Yenisei near Turukhansk to L. Yessei would be about 1,200 versts in length, and would lie entirely within their territory. We encountered also some members of smaller groups of Tungus, the Turiisk (named from the River Turo) and the Chapogir.

In the dark mid-winter season the nomadic habits of the people are for the time suspended. Hunting is impossible, and they live for about three months on the stores of venison laid in during the summer and autumn. It is the season of visiting and matchmaking. The matchmaker is a regular institution in all these northern tribes; but among the Tungus, the procedure of matchmaking is not so elaborate as it is to the north-west. Two elderly male friends of the suitor visit the chum of the parents of the girl he wishes to marry. They bring gifts to the father, and negotiate the amount of the kalym, or price paid for the wife. When this is settled, and an instalment paid, the suitor may make a visit to the chum, lasting for any length of time from a day or two to a fortnight. When the whole kalym has been paid over, the young woman mounts a reindeer with elaborately ornamented riding-gear, and rides to the bridegroom's chum. On her arrival a male member of the bridegroom's family leads her reindeer three times round the chum. Then, lifting her out of the saddle, he carries her into the tent. She seats herself humbly close to the entrance, but the bridegroom goes to her and conducts her to her proper place beside his.

But it is not always easy for a Tungus youth who respects the traditions of his people to find a bride. For among these people a man may not take his wife from his mother's clan, or from a clan into which his brother or sister have married, nor may he marry a member of his own clan. Nowadays, however, when most of them are nominally Christians, they make their formal acceptance of the new religion a pretext for marrying within the degrees prohibited by their own customary law. For the decline in their numbers, and the con-

ditions of a nomadic life in the north, which have scattered a small population over an immense extent of territory, make it difficult to keep up the traditional restrictions.

In spite of the formal adhesion to Russian Orthodoxy, it is the native and not the Russian Church marriage which is regarded as essential by Tungus society. The Tungus in the original strictness and elaborateness of their marriage restrictions offer a marked contrast to the Yurak, among whom marriage between the nearest relatives is allowed.

We were generally quite hospitably received, though, of course, gifts are expected. For this purpose a good stock of tea, tobacco, and cotton cloth are indispensable. Medicines they ask for whether they need them or not; and these are not regarded as gifts.

In February we were at L. Chirinda, where the Prince of the Limpiisk Tungus spent the dark months of the winter, and where the munyak, or annual native council of the Limpiisk territorial group was held. It lasted for three days, February 15th, 16th, and 17th. After the collection of the tax, which the Russian Government levies on all natives at the rate of so much for each group according to its size and estimated wealth, and for the payment of which the Prince is held responsible, various cases were brought before the Prince as judge. The greater part of these were concerned with the ownership of strayed reindeer. An interesting case of another kind was that of a widow whom the Prince ordered, against the opinion of most of the council, to return to her deceased husband's brother, though it seemed clear that the man ill-treated her to such an extent that she had run away from him. Tungus custom requires a widow to live in the household of one of her dead husband's brothers.

Eastward from L. Murukta to L. Yessei, we were still on Tungus territory, but most of the chums are Yakut. These people are carrying out a policy of peaceful penetration into the Limpiisk lands. They play the rôle of *kultur-träger* among the Tungus, which the Dolgan are performing further north among the Samoyed. The Yessei Yakut inter-marry freely with the Tungus near them. They adopt the Tungus costume, except for some details; and are called by the Yakut of the Yakutsk territory "Tongus."

The Tungus of the Yenisei, or rather of the tundra between the Yenisei and the tributaries of the Lena, are the



Fig. 3. Samoyed Native Tent, showing sledge containing gods, and fox skins offered as sacrifices.



Fig. 4. Reindeer at a Stream.

same Tungus as those of Yakutsk territory or the Amur district. But, thanks to their isolation and their enforced restriction to the life of reindeer nomads, they are the most primitive of all Tungus, and the purest racially, except on that eastward fringe of the territory where they have begun to intermarry with the Yakut.

The hours of daylight were lengthening considerably, and the sun, warming the slopes of the hills, was thawing the ice on some of the shallower streams. We must travel fast to reach the Yenisei; or we should have to remain in the tundra until the next winter. Our way back to the river did not follow exactly the same line as our outward route, so we met some new people as well as old friends. Our guides did their best to carry out my often-repeated injunction to help me to see "all the Tungus in the tundra." It was warmer now, and there was not so much danger of serious frostbite; but travelling was even more difficult owing to the frequency of blizzards—the dreaded *purga*—in the month of April, and the occurrence of patches of open water and rotten ice in rapids and shallow parts of streams.

The Yenisei and the Tunguska were still fast bound in ice when we reached Turukhansk at the junction of these two rivers, at the end of April. Here we met many Yenisei Ostyak. These are a people quite distinct from the Ostyak-Samoyed we had seen in the previous summer. Their language is said to belong to the Indo-Chinese linguistic family, while in their physical type they resemble the not long extinct tribes of Arine and Kott, all of them called Yeniseians. I was especially interested in their shamanistic ceremonies, almost the only feature of their old customs which has not been lost through contact with the Russians on the river. This vanishing people has retained one instance of their old superiority over their neighbours; they are still unexcelled masters in the making of compound bows and arrows, and are recognised as such from the Ob to the Lena.

As soon as the Yenisei was open we boarded the first steamer to arrive, a little dirty tramp known as the "Otyetz," for the first stage of the homeward journey. At Vorogovo we saw the first Austrian and German prisoners of war. The nearer we got to Krasnoyarsk the more of them were to be seen.

From Krasnoyarsk we went south to Minusinsk, in the

heart of the steppes, and in the Minusinsk and Abakansk steppes we saw the kurgany, or burial mounds, often surrounded by stone circles. These burial places are usually attributed by specialists on this region to a people known as the Chud, a name used loosely by older writers to include several Samoyedic, or perhaps Finnic, tribes which once occupied a region further to the south. Later investigators ascribe the so-called Chud remains either to the ancestors of the Turkic tribes of Kachints, Sagai, and Beltir—so-called Minusinsk Tatars—who now inhabit the steppe country where these burial mounds are found, or to the old fair-haired and blue-eyed Yeniseians, the supposed forebears of the Kirgis and the Yenisei Ostyak. Some West European archæologists look upon these Chud remains as part of the “road of the Scythians,” but it has never been proved what was the anthropological composition of these so-called Scythians.

Packed into tarantasses—great wicker baskets on wheels—we drove behind swift steppe horses from one native ulus, or village, to another, hunting for museum specimens and making new acquaintances among those people of the southern Yenisei, so different in appearance and mode of life from the northerners among whom we had been living.

The Minusinsk museum is older, and, especially in its archæological department, much richer than the one in Krasnoyarsk. We found here, besides large collections of objects from the burial grounds, large stone figures of the old Chuds, specimens of curious pictographs from the cliffs of the southern Yenisei, and polished stone implements coeval with those of the Siberian iron and bronze ages. It is an interesting fact, by the way, that the copper mines of this region now being exploited by Russians, are old Chud mines, worked ages ago by a people who must have reached a fairly high level of civilization.

The only Yenisei natives to whom we did not pay even a short visit are those of the Sayan mountains on the southern border of Siberia—the Soyot or Uriankhai. Officially only a small part of these people are Russian subjects, but in fact they are all now more under Russian than Mongolian influence.

In 1806 a portion of the Yeniseisk Government towards the Mongolian border was cut off and constituted into the Usinskii Krai (Usinsk Country)—Krai being a name usually

given to a larger extent of country than was included in this region. Probably even then the Government was looking forward to a peaceful penetration of Mongolia, which should add to the Empire lands wide enough to justify the title. In more recent times the Usinsk country has been, unofficially, extending its borders further and further southwards, and several Russian settlements, of which the chief is Turan, have grown up across the Mongolian border. This is a case of the flag following trade, rather than trade the flag. Russian settlers—traders and farmers—have established themselves among the Soyot, and Russian schools and courts have been established among the settlers. Since the Russian law is more liberal than the Mongolian, the natives prefer to have recourse to Russian judges rather than to those appointed by their own nominal rulers, and, although most of the Soyot-Uriankhai still pay taxes to the Mongolian authorities, the whole region has become Russian *de facto*, whatever it may be *de jure*. The encroachment on Mongolian territory is proceeding faster in the southern Yenisei Valley than in the L. Baikal region.

Although the administrative division of Siberia is into Western and Eastern Siberia and the Amur Sea-coast Country, for the purpose of considering its economic possibilities the first two divisions may be thought of as one whole. The Yeniseisk Government which was the scene of my researches, stretches across Siberia from north to south, and although it is assigned officially to Eastern Siberia, it occupies the central portion of the country, and in its varied natural resources may be taken as presenting an epitome of those which characterise Eastern and Western Siberia as a whole in contradistinction to the Amur Country. It was to the development of the latter region that Russia first turned her attention after the formal annexation of all Siberia to the Empire; and, almost up to the present time, the Amur Country has engrossed the attention of Government and settlers at the expense of the rest of Siberia. This may be accounted for largely by the fact that its climate on the whole is milder than that of any other part of Russia in Asia, and its products more of a southern type, resembling those of northern China; while the products of the rest of Siberia are very similar to those of European Russia itself. Of course, political and strategical considerations have also determined this policy. I am not qualified to say more of the Amur country from this aspect; but the prospects and

possibilities of the hitherto neglected central region is a topic that should, I think, be of even more interest to a British audience. It is nearer home for one thing, and, for another, it is an almost virgin field for enterprise.

It was an Englishman who was responsible for the modern re-opening of the north-east passage to central Siberia—a route the continued use of which would seem to be an essential factor in the development of the country. I say “re-opening,” for the route to the Ob and the Yenisei was known and used by mariners when Novgorod, and later Moscow, were Grand Duchies, but had been closed to trade through the short-sighted fiscal policy of that Government for some two centuries, when Captain Wiggins brought his steamer through the Kara Sea into the Yenisei. The reimposition of prohibitive customs dues on goods brought into Siberia by this route made Captain Wiggins’s pioneer effort for the time abortive; but since 1905 there has been a more or less regular traffic with central Siberia in goods brought through the northern seas.

To understand the importance of the opening of a permanent sea route to Central Siberia, one has to take the point of view of a Sibiriak, whose interests in this matter are in fact opposed to those of certain influential merchants of European Russia. Before the opening of the Trans-Siberian Railway, trade with Siberia was monopolised by a few large dealers in Russia who exacted abnormally high prices for the manufactured articles which they sent into Siberia and paid very low ones for the raw material which they brought out. With the opening of railway communication, and the stimulus this has given to emigration to the agricultural lands of Siberia, the situation has changed. Now minerals and furs no longer form the principal exports of the country; in the production of foodstuffs—cereals, meat, and dairy products—Siberia has become the rival of European Russia; and as the farmer and ranchman can now send their products to the markets of Russia, the old monopoly of the middlemen is seriously threatened. The establishment of regular steamship traffic, which is cheaper than that by rail, *via* the Ob, the Yenisei, and the Kara Sea, by throwing open other European ports besides those of Russia to the direct delivery of Siberian products, would complete the overthrow of the power of the important vested interests I have referred to. It is not diffi-

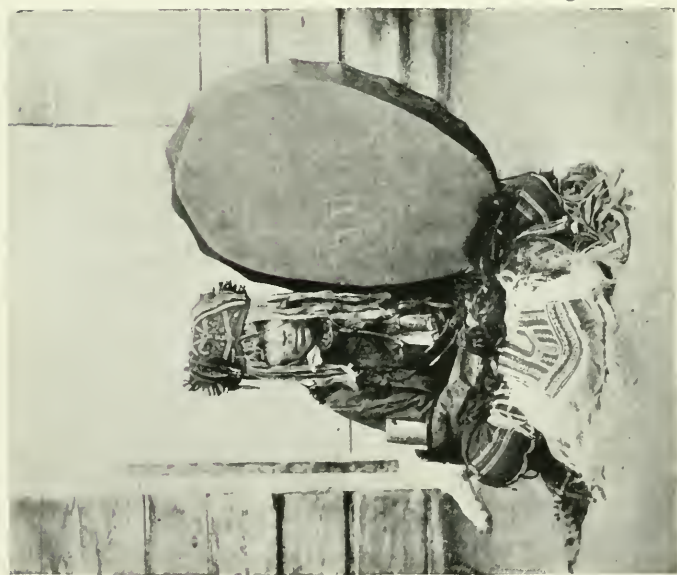


Fig. 5. Tungus Shaman in his ceremonial dress.



Fig. 6. Michikha, the Author's Tungus Companion.

cult, then, to understand the opposition of a coterie of Russian merchants to the establishment of this route, an opposition which at several periods in the past has led to its being closed through the imposition of prohibitive customs dues.

Siberia has a magnificent system of natural interior waterways, the connection of which with each other and those of Russia in Europe by canalisation should not present insuperable difficulties. But the Sibiriak does not look forward with much hopefulness to the solution by this means of the problems, with which he is beset through his isolation from the markets of the world. He points ruefully to the case of the Ob-Yenisei Canal, which, although it was begun in 1882 and has cost 5,000,000 roubles, at present exists, so far as the greater course is concerned, only on paper. He sees more hope for the *immediate* future in the development of a sea-route for his products.

It may be said that few projects having as their aim the development of Russia's great colony have received more encouragement of late years in Petrograd than this of opening up the north-eastern passage. The scheme has proved quite feasible so far as regular communication by sea with the mouths of the Ob and the Yenisei is concerned. Every year, for several years, fleets of sea-going cargo boats from English and Norwegian ports have entered the rivers. The Russian Government has established a chain of radio-telegraph stations along the coast eastwards from Archangel to the mouth of the Yenisei, by means of which masters of vessels can be kept informed throughout the voyage of the conditions with regard to ice in the Kara Sea. The principal difficulty in reaching the Pacific by way of the north-east passage arises in connection with the rounding of the Taimyr Peninsula, the great northward extension of the Siberian coast-line to the east of the Yenisei. Since 1912 four expeditions have been sent out from Petrograd to make a coast survey and meteorological and other investigations of this region. In addition, there have also been sent six other supporting or relief parties, for many mishaps have attended the original expeditions. One of these relief parties brought aid to Captain Wilkicki's hydrographical expedition which went out in 1910. Captain Wilkicki has lately returned to Petrograd. It is proposed to extend the radio-telegraph stations further east along the coast, and southwards on the rivers to points where they can connect with the existing government telegraph lines.

Siberia has a certain amount of trade of her own passing eastwards through Vladivostok. But before the war this had not been developed to any great extent. For the last two years, however, Vladivostok has been almost the only open port of Russia and a ground of commercial rivalry between the United States and Japan. There is also some traffic, in Siberian products, passing southwards into Mongolia and China.

Through the energy of the Sibriaks themselves some branches have been added to the Trans-Siberian trunk line of railway, and others are planned or building. The Amur and Altai branches have been completed, and in the Abakan steppe my tarantasse skirted for some time the tracks of the Achinsk-Minusinsk branch line, then approaching completion.

Time does not allow of my making more than a bare mention of some of the chief Siberian exports; these are:—Minerals, timber, furs, wheat, rye, hemp, flax, meat, game, fish, butter, and other dairy products, in all of which the production is capable of indefinite extension.

In spite of much that has been done by progressive Sibriaks and by the political exiles, one of the great obstacles to progressive Siberia is the backward state of education in the country. Closely connected with this is the low condition of commercial and industrial morality, a reproach which will no doubt be removed when the progressives have succeeded in obtaining the reforms in government which will permit of making education more general and enlightened. There is a growing demand for some measure of self-government in Siberia, of the type of which the British Empire has offered models to the world in her great self-governing colonies; and the programme of the reformers includes not only plans for their own social and industrial betterment, but also for the more effective protection of the native tribes of steppe and forest and tundra, in which plans they have my heartiest sympathy.

A SHORT SKETCH OF CHINESE HISTORY.

By JOHN HILDITCH, M.R.A.S., F.R.G.S.

(Being Portion of an Address on "War as a Preserver of Chinese Art," delivered to the Society in the Geographical Hall, on Tuesday, February 8th, 1916).

CHINA is the world's oldest nation; beyond the date at which the Hebrew historian fixed the Flood this Empire had subsisted for countless centuries.

In the period dating about 2,250 years B.C., around which legends are intermixed with facts, we have solemn records of the then Emperor repairing to the *temple of his ancestors*, and communing with their spirits concerning the heritage they had left to him.

And even in this remote age we are given a fair view of the kind of people the Chinese were—so honest that if a traveller on the roadway dropped a parcel or a letter he would be certain of finding it when he returned to look for it, because no other traveller coming along would be so dishonest as to pick it up!

It was also the age of the enquiring mind, and a certain Emperor, diving deeply into the study of herbs that he might find remedies for his people, was ingenious enough to have a glass covering made to his stomach so that he could watch the influence of each herb on the system!

In the year 2697 B.C. the reigning Emperor, having provoked the people to wrath by his departure from the paths of rectitude, was marched against by a feudal chief who had raised the standard of rebellion. The battle ground was at Choluh, in the province we now know at Chih-li, and there the rebels would have been worsted immediately had not their leader, by certain enchantments, hid his men in a mist!

They were, however, subsequently discovered, and the chariot of the Emperor dashed into their midst and captured and slew his foe.

This man, Ch'ih-yen by name, with whom this battle originated, has an unenviable reputation in the eyes of Chinese historians as being the man who broke in upon the peace and innocence of their primitive society. He certainly

has much to his account, for wars having once begun they go on joyfully for five times five hundred years and more.

The second war which is recorded shews two men determined to try issues and see whom Heaven intended should reign. The man who holds the throne urges his men "to show themselves courageous in conflict, and to listen well to the orders of their officers so that there may be no confusion in the coming battle."

He also promises rewards to those who distinguish themselves, but death—for themselves and their families—is to be the portion of those who show themselves cowardly before the enemy.

In these days, when going into battle, the Emperors carried with them certain tablets in which they believed were enshrined the spirits of their ancestors. By so doing they believed that they were carrying with them all the unseen influences which gathered round these beings which would help them in the coming struggle!

As the years passed many of the emperors certainly had need of the help of all the unseen influences they could gather. Fighting for the throne became in time a common game, and if commanders were not leading their men home they were leading them out to battle, and *vice versa*.

The civilizing influence of a good sovereign here and there kept foes in abeyance and held rebel hordes at bay, but far more frequently there was discord and hostility.

Very conveniently, at times, there were rebukes made by Nature herself to wayward rulers, and frequently these had the desired effect and set the monarch to strive afresh to attain the summit of virtue.

. The seat of the Court was changed with wonderful alacrity. Sometimes the removal was owing to an inundation of the Yellow River, and the capital would be transferred from Po in the modern Shang-Kin to Ao, then in a short time another Emperor would make his capital at Siang in the present Ho-nan, and his successor would move on to Kêng in Shen-si, on account of the Wei River following the precedent set up by the Yellow River. Then the capital would be again set up in H'ing-tai in Chih-li, where it would remain for a few years. From there it would be changed to Yin, a town north of the Yellow River in Ho-nan, because the then Emperor desired to be in the region where his

PLATE I.

(HILDITCH COLLECTION.)





father's spirit dwelt. His successor would then desire to be elsewhere, and the capital would move like a caravan from the North to the South, from the West to the East, or from this side of the river to that, until the voice of the people rose in dissent at the sacrifices involved in so constantly abandoning property and land.

But more effective than the complaints of the people was the plan of the faithful Minister of the Emperor Kan-ti. This Emperor, like his predecessors, desired to change his capital and set up his throne in Ho-nan. But while this was under consideration war broke out, and for many months the Emperor was away with his armies fighting the barbaric hosts of the Hung-nu.

When he returned to Shen-si he found that a magnificent palace had been built for him, and reproving his Minister for this expenditure in war-time when the revenue was exhausted and economy necessary, his wise and faithful servant replied—

“The Emperor is the greatest man in the Kingdom, and unless he has a palace to live in suitable to his dignity he will not get the respect and reverence of his people.”

With this the Emperor was satisfied, and remained at Shen-si.

Other Emperors, however, were brought to book on matters of far less importance than the changing of a capital. Chow-sin, a sovereign of marked ability and great physical strength, introduced for his own use chop-sticks made of ivory. But such an extravagance was this considered that his ministers gravely reproved him and predicted that his over-indulgence would cost him his Empire!

About the year 500 B.C. the coming into power of Confucius as a magistrate and minister of justice exercised a wholesome influence upon Emperors and people alike. Nor was it a narrowing influence, for it crept into provinces far removed from the capital, and his methods of government were widely adopted.

Even Confucius, however, could not allow himself to remain in position when the moral laws he put forth were disregarded.

Accordingly, when a ruler of an important state accepted a present of 80 beautiful ladies and 100 fine horses, Confucius bereft himself of his power as a minister and went upon his travels as a teacher.

The state and condition of China through its first known history form a fluctuating struggle which must in its main features be known to many of you here to-night.

I shall not, therefore, take up your time by leading you through any unnecessary labyrinth of detail, having, I think, said enough to bring to your mind some remembrances of this ancient Empire, with its mountain ranges and great rivers, and its black-haired people and fertile provinces.

The country, as you will remember, is bounded on the north by Mongolia, on the west by Turkestan and Tibet, on the South-West by Burma, on the South by Tonquin and the Tonquin Gulf; on the South-East and East by the China Sea; on the North-East by the Yellow Sea, the Gulf of Chih-li, Korea, and the Sea of Japan.

Now, as we have said, the thrones of the early monarchs were set up chiefly in the towns or cities reaching toward the North. Consequently, when the early invaders appeared they came principally from the North and North-West, and chiefs and generals were frequently employed in forcing back the stream of invasion.

During the periods of the Shang Dynasty, which held sway between the years 1766 and 1122 B.C., the Emperor Wu Ting, who reigned for 59 years, was engaged in a fierce conflict for three years with the wild northern tribes, and in the same Dynasty a terrible battle was fought at Nish, a celebrated battlefield in the North of Honan, in the present county of K'i.

This was a battle arranged, it was said, by Heaven, to punish a wicked Emperor, and the slaughter that ensued was so terrible that the wooden pestles of the mortars which the soldiers carried with them in which to prepare their rice are said to have floated in blood.

The battle ended in victory against the Emperor, who arrayed himself in gorgeous apparel and perished in the fire which he had ordered to be lighted to destroy himself and the famous Stag Tower which he had caused to be built for his Consort—a creature of infamous character, who deserves not the name of woman.

Fa, the victorious leader who had set his armies in motion against the Emperor, entered the Capital as a gallant and humane character.

With the defeat of the last tyrant of the house of Shang,

the Chou Dynasty was started by Wu Wang, who reigned from 1122 to 1115 B.C., and whose fame spread far beyond the nine provinces of his Empire.

For 50 years the Empire went on in tranquillity, and peace and plenty existed.

But now came a succession of short-lived Emperors, and the raids of barbarians, envious of China's power, were not uncommon, and royal troops were continually kept in readiness to scatter these foes.

But more costly to the country were the armies that were always ready to rise in rebellion against infamous rulers who had equally infamous consorts. These holders of power usually worked out their own destruction, as instanced by the Emperor Yiu and his consort Pau-sze, to whom he was enslaved, but from whom he could never win a smile!

A system of beacons was in existence at that time, to be lighted in times of grave danger, when vassals were bound to come to the assistance of the Emperor.

To make his wife smile the Emperor Yiu lit these beacons one night, and princes and nobles and troops came dashing to the relief of the capital.

Pau-sze smiled to see them come and march away again like men on a fool's errand, and in that unholy smile the Emperor got his reward.

Shortly afterward his Imperial Majesty was thwarted in his desire to put to death the legitimate heir to the throne in favour of a son of Pau-sze's.

This led to battle. His ministers went against him, and called in the help of a tribe of barbarians.

Afraid of the dangers that faced him, the Emperor now lit the beacons in earnest, but there was not a single response to his call.

The Emperor was slain, and his wife carried off as the property of a barbarian chief.

This was a terrific blow at the fortunes of the Chou Dynasty, and the Jung barbarians, finding China a pleasanter land than their own, were loth to depart.

To get rid of them the aid of the three powerful states—Tsin, Wei, and Ching, was secured, and after a terrible battle the Jungs were driven outward.

And then the chief of the Tsin estate did not want to return home, nor did he!

He stayed, and wormed his way into power, and snatched back land which had been wrested from China, and caused his own state to increase in power and importance till he there had a standing army of 50,000 men.

Then he began to look around for opportunities of conquest, and by strategy as well as prowess, he immediately annexed the principalities of Hung, Kang, Wei, Kwo, and Yu.

As rulers sat upon the throne devoted to their own pleasurable pursuits, or spending their time in keeping invaders at bay, or looking well to the state of the poor in the land, there were going on interminable wars between the States, with history centreing chiefly in Tsin, which was continually growing larger at the expense of the conquered.

The Emperor Nan—314-255 B.C., seeking to interfere with the growing power of this State, was immediately conquered and forced to surrender all his lands and his soldiers to the conqueror, and also to go through the humiliating process of entreating forgiveness on bended knee. The Emperor, the last and the most unfortunate of the Chou Dynasty, then went out into liberty only to welcome Death as an antidote to his boundless grief.

But before the passing of Nan, the last of the giants of the forward march of the Chou Dynasty had already gone to their doom, and Nan's death now but closed the records.

The Dynasty had lasted for 873 years, and doubtless exercised a more powerful influence over the succeeding ages than any other. There were great scholars, great teachers, great philosophers, great art workers, great statesmen, great generals, and a few, at any rate, of its rulers, had the genius which makes kingship great.

But millions of lives had been lost in the wars which had been made through internal strife alone, and it was an Empire swayed by confederacies of feudal princes when the Tsin Dynasty dawned in the year 255 B.C., to be consolidated and drawn together by the Emperor known as Chung. He was only a boy of 13 when he came to the throne, and though he was the third Ruler of the Dynasty, to him is assigned the honour of being the *real founder* of the Dynasty.

He proved to be a man of great strength of character; he could gather masterful men about him, and know how to handle them so as to still keep his own superiority on top.

He conquered and annexed by many a bloody battle all

PLATE II.

(HUDNICH COLLECTION.)





PLATE III.

(HUPITCU COLLECTION.)





the States which had not already come under Tsin Government, and so founded a new and homogeneous Empire on the ruins of the feudal system.

He extended the Empire widely toward the South, drove back barbaric hosts on the North, divided the country into 36 provinces—embracing about three-fourths of what is now called China proper—and justifying himself as master of the whole of China, he considered he had the right to be known by the title of First Emperor—Shi Hwang-Ti.

But great man though he was, the Emperor had a corresponding weakness, and was in constant fear of death, and there was one way of which he was always conscious that Death might come. And that was in battle with the horse-riding nomads of the North, who never seemed to weary of making excursions to harass and invade his Kingdom.

These nomads were known as Hiung-nu, and were in reality the Huns or Turanian hordes that lay in their thousands in the wilds between the Carpathians and China. They were the ancestors of *Attila and his scourges*, known then as the “Scourge of God,” though by what names their descendants—the Huns we are fighting to-day—will be known in history is more than I can tell.

Well, the Chinese Emperor living in the year 230 B.C. would have none of the Huns, and was resolutely determined that Death should not come to him by their forces.

Consequently he set about building a rampart of defence.

A century or so before a few stretches of wall had been built in the West and North of China by men who deemed them adjuncts to the safety of the districts, but now Shih-Hwang-Ti set about the building of one great Wall which would prove an impassable barrier to the Huns and to every other invader from whatever point they sought to find an entrance.

Accordingly, the few erections which had been made were united, and the Great Wall continued for a thousand miles, regardless of obstacles across hill tops and valleys, over bridges and up precipitous faces of rocks, all along the northern frontier of China to the Gulf of Leao-tong. Then was the Emperor satisfied that the Huns could have no power against him.

But not only had Shih Hwang-Ti a great and passionate desire to save his life, but he was also obsessed with the idea

of making his life a central pivot on which everything must turn.

He wanted to entirely snap the fetters which bound his people to the past, and to bring the past consciously to an end that he himself might be the beginning of Chinese History.

Consequently, everything that hindered his purpose must be cast aside. As in the building of the Wall every obstacle had to be overcome, so in his supreme effort to establish himself as the First Emperor, Shih-Hwang-Ti allowed nothing whatever to stand in his way.

Accordingly, he ordered the wholesale destruction of historical records, philosophical writings, and indeed every kind of classical literature save those which touched on the value of medicines, divinations and husbandry, and by these means he sought to blot out from the minds of the people all love and veneration for the past, and to focus their interest entirely upon the present. But it was not literature alone which came under the Imperial ban, but also works of art, and especially *bronzes*, for vessels made in bronze were used in the most primitive of cults, and in that early worship of Nature which was the first State religion of the Celestial Land.

After a reign of 37 years this great but ruthless Emperor and statesman met his last enemy—the enemy he had so dreaded—and he died while on a tour through his kingdom, and his son, who had murdered his brother that he might claim the throne, came into power as a weak and cruel monarch, utterly unfitted to carry on the Dynasty.

It lasted but three years after the powerful Shih-Hwang-Ti's death, and these were years of strife and bloodshed, and a rude and rapid loosening of the power of the throne, which fell from its last Emperor into the hands of the men of the glorious Dynasty of Han.

This Dynasty chosen by its first Emperor to be known by the title of Han, on account of his birthplace being near the river of that name, is termed *glorious* for various reasons.

In the first place its government was hailed as a positive relief from the severe ruling of the strong and masterful Shih-Hwang-Ti.

Beside, the Han rulers were, many of them, humane men, and able to temper judgment with mercy.

Indeed, even the work of Mr. Lloyd George was antici-

pated by Wu Ti of the year 179 B.C., for this Emperor, if he did not introduce old-age pensions, at least enacted that men over 80 years of age should be provided by the State with meat, rice, and a certain amount of spirits, and for *those over 90 sufficient silk for a dress* should be added.

Also the Han Dynasty was the first to open up regular communications with Western Countries. This they did by sending as envoy one Chang Ch'ien on a mission to the Yuchti or Indo-Scyths on the banks of the Oxus River. But in Eastern Turkestan he was trapped by the Huïng-nu and interned for ten years. Securing his freedom at last, he resolved to return by the Khotan Lobnor route, but there he also suffered imprisonment for the space of about two years, and eventually returned to China after an absence of 13 years.

You, therefore, may imagine that the opening up of trade communication with the West was not an affair of hustle. But the overtures, save for delays and difficulties, were peaceful, and the envoy coming into contact with the Persians and Greeks, brought back strange treasures of Western manufacture, and a permanent caravan trade between China and Rome was set up—thus the first great line of world-trade over the central regions of our globe were established.

But the *eclat* with which the Han Dynasty was ushered in brought with it refinements of military power which were not to prove unnecessary. . . The history of the reign of almost every ruler was stiffened with bloodshed, and wars, which we need not enlarge upon, frequently originated with the Emperors themselves, though often to quell rising barbarians, who continued to menace the throne through all the periods of this Dynasty until it gave place to the "Epoch of the Three Kingdoms," which perhaps provides more excitement and romance than any previous period.

In war there were fine strategical masters meeting at points where the flash of their genius led countless thousands to their death, and in the Council Chamber near the throne were schemes of murder, and revenge, and hatred, resulting in the destruction of powerful ministers and infamous rulers, whether men or women.

In the reign of Wu Ti between the years 265 and 290 A.D., a war was set on foot by the Emperor against the territory of Wu, and in the light of our nation's experience of Germany's

attempted blockade of the sea, one incident in the opening of this war is extremely interesting.

The general in command of the Emperor's army had to gather his men hastily from their agricultural pursuits and place them on the banks of the Yang-tze to prepare boats in which they might cross the river that had proved so successful a barrier to many hosts that had previously endeavoured to invade the land beyond.

But when the ruler of Wu heard of the vast preparations that were being made against him he determined to render useless the hundreds of boats on the river's brink.

Accordingly he had iron stakes driven into the river at regular intervals along the shore, and to these he had chains fastened from point to point in the islands which studded the river, so that no boats might pass.

He thus fortified the river and produced a Blockade indeed !

All attempt to cross the river was given up for the present as impracticable.

Some three years after, news of the wicked tyranny of the ruler of Wu still passing from mouth to mouth, another attempt was made to wrest his territory from him.

This time the Imperial army was under a new General, and he floated down the river immense rafts of wood which were covered with combustibles, and, being set on fire, were allowed to drift on to the iron chain barriers, which melted under their great heat. The army then proudly crossed the river, and marching to Nanking, then the capital, they invested the city.

Conscious now that his dominions were gone from his hands, the wicked dignitary to whom they had been entrusted became at once a member of the "*Lost-all Brigade*," and *with a servant carrying his coffin by his side*, he came out of the city to meet his conquerors, and gave himself into their hands.

Rebellions and wars and battles undertaken with feverish haste in this cause or that were the inevitable sequence to the greed of power and dominion which characterized many rulers through the next 200 years, and yet amid the débris of tottering thrones and dying dynasties there are occasionally to be found principles upheld which might bring the blush of shame

PLATE IV.

(HILDITCH COLLECTION.)





to the Teutonic rulers of to-day if they were not so hopelessly debased.

In 383 A.D. there was a corner of the land unpossessed but much desired by the ruler Fu-Kien. Calling his officers and nobles, he said—

“My Kingdom is now at peace in all its quarters. Tsin possesses now but a quarter of the whole of China. I have nine hundred and seventy thousand soldiers ready to take the field. I think we should at once proceed to march on their Capital, and add its dominions to ours.”

But the minister Kwan-Yi, a loyal man and true, rose up and said—

“Yes, the Tsins just now are weak and their territory small. But they have done no wrong that we should attack them, and to justify ourselves we must have some good reason to give the world for our invasion.”

But often there were ministers less faithful to their Country and more in subjection to their ruler, and the tale of murder, cruelty, treason, wars with foes at home or with barbaric hosts on the frontier, go on through successive generations, while all the time the people's vengeance and the tragic fate of dynasties, disorder and rebellion and progress in art and science were somehow making for the goal of a new enlightened China.

But how, through all the labyrinth of the centuries we have looked upon, was art preserved? Or how, indeed did it manage to exist through the terrible stress and strain which were its environment?

Now the chief records of art of the periods mentioned to-night are records which have been found in the form of dug-up bronze utensils, and in these there is abundant evidence that one century's knowledge was preserved for the next and handed down with unremitting care.

But China was not yet China, only a peaceful land, unconscious of its great destiny when the first tangible interpreter of the love of arts within him fashioned with his hands the work which his mind had inspired.

Even in the earliest days of their history the Chinese believed in spirits—the spirits of the dead—the spirits of nature—and the spirits of Heaven—were all objects of worship, to which offerings must be made, and it was in the

designing and producing of vessels fit for such offerings that Chinese art had its birth.

As centuries rolled on the art of working in bronze still progressed, and artists and craftsmen wrought for the welfare of art as the soldierly element fought for possession of land.

And we must remember that as in other lands, so I am sure that in China at this time did it hold good that no great artist or craftsman placed himself in any war on the side of tyranny and oppression, but through all the ravages of time's battles went on making all serious use of their talents for the high purposes set before them.

N.B.—The four illustrations are from photographs of relics in possession of the author.

DESCRIPTION OF ILLUSTRATIONS.

PLATE I. Chinese Bronze Sacrificial Wine Vase, or Tsun, of the Shang Dynasty, 1766—1122 B.C. This ancient piece, decorated with bands and conventional palm leaves, in which are enclosed varying designs on scroll grounds, is almost covered with a rich green patina, changing from light to dark, inside and out. K'wei dragons of exquisite workmanship form handles at the neck. About 4,000 years old. Height 2 ft.

(Hilditch Collection.)

PLATE II. Tang Massive Bronze Seated Figure of a Nobleman, holding a walking stick with dragon's head in token of his office. (Height 2 feet.) About 618 A.D.

(Hilditch Collection.)

PLATE III. Chinese Bronze Mirrors and Coins from 2,600 years old.

(Hilditch Collection.)

PLATE IV. Chinese Pottery Wine Jar, with cream glaze and sepia decoration in floral design at the neck, with two bands of wavy lines below, and broad band of conventional floral sprays. About 960 A.D. (Height 27 in.) With four Grave Urns and two Bowls of the same period.

(Hilditch Collection.)

A HALF-CENTURY OF GEOGRAPHICAL
PROGRESS.*

By J. SCOTT KELTIE, LL.D., late Secretary R.G.S.

(Addressed to the Society in the Geographical Hall on
Tuesday, April 4th, 1916.)

WHEN I undertook to give a lecture on geographical progress during the last half-century, I am afraid I accepted the invitation with a light heart. It was only when I began to face the subject that I realised its magnitude. To do it justice would take volumes. In the brief space of a lecture I can only hope to indicate succinctly the lines upon which the main advances have been made; to bring before you an impressionist picture, marked, it may be, by some of the bewildering confusion characteristic of that evolution in the domain of art.

Before dealing with the main subject of to-night's meeting, it may not be inappropriate to inquire briefly to what extent the war has affected geographical work. So far as exploration is concerned, I fear the result has been to discourage new exploring expeditions on the part of the nations that are engaged in this momentous struggle between freedom and thralldom. Fortunately the great British expeditions that had been initiated before the war began are still "carrying on," as the sailors say, in regions which the war does not touch. Sir Aurel Stein is continuing his great work in Central Asia, with magnificent results, and is now in the Pamirs on his way to Meshed and Seistan. Sir Ernest Shackleton, whose expedition had been organised before the war, proposed to the King, I believe, to place the services of himself, his staff, and all his equipment at the disposal of the Government, but His Majesty urged him to carry out the work of his expedition as planned. The war has already exacted a heavy toll on explorers. Captain Toppin, the leader of the Peruvian-Boundary Expedition, who was to have lectured on the work of the expedition to the Royal Geographical Society last session, lost his life soon after joining his regiment at the front, along with his colleague, Captain Moores. Captain Shakespear, who car-

* Reprinted by kind permission, from the *Scottish Geographical Magazine*, with certain alterations and additions.

ried out a splendid journey across Arabia, just before the war began, was ordered to return to his post at Koweit, Arabia, and shortly after perished in a fight between two Sheiks, one pro-British and the other pro-Turkish. Apart from such unfortunate results the geographical work at the Universities has in most cases been seriously affected, and that again has had its influence on the work of geographical research.

On the other hand, the maxim that war is the handmaid of geography has once more been amply verified, as well as the converse that geography is the handmaid of war. Our papers every day abound in information for the multitude, in many cases accompanied by maps, relating to the various countries involved in Europe, Asia, and Africa. Those actually engaged in the war have found how indispensable are good large-scale maps of the regions in which operations are being carried on, as well as detailed information concerning their physical and economical geography, their geology, climatology, and other characteristics. I may venture to say that since the beginning of the war the Royal Geographical Society has been doing so much work for the War Office and the Admiralty that its staff has had to be increased to the limits of its accommodation. One result of this special work was described in the July *Journal* by my successor, Mr. Arthur Hinks, in the shape of a new map of Europe and the Near East, on the plan laid down for the International map of the world, which, when complete, will be useful for many purposes besides that for which it has been specially undertaken. I need hardly remind you to what extent geographical considerations have been adduced by certain of the combatants at least to disguise individual national ambitions or defences. Such then are some of the ways in which this mighty war and geography have interacted on each other; on the whole we may hope that the final result will be to the advantage of British geography, as we hope it will be to many other British interests. Of the many books and articles which have been called forth by the war I venture to think that one of the most useful and most instructive is the work on the Balkans by Miss Marion Newbigin.

First of all it may be useful to make it clear to ourselves what is the field covered by the subject, the progress of which during half century it is our task to trace. I think for our purpose we may regard geography as the science which deals

with the distribution of the features of the earth's surface and of all that it sustains, mineral, vegetable and animal, including man himself. In fact, man is the ultimate factor in the geographical problem, the final object of which is to investigate the correlations which exist between humanity and its geographical environment. It is evident then that before the geographer is in a position to apply scientific methods to the problem which it is his function to solve, he must first have an adequate knowledge of the data which form the terms of the problem. Such data can only be obtained by the exploration of the earth's surface conducted by scientific methods. Therefore in attempting to review the progress of geography during the past half-century, our first task is to ascertain what have been the main additions to our knowledge of the earth's surface by means of exploration. Secondly, we should endeavour to ascertain what progress has been made in our methods of dealing with such results; has there been any marked advance in the application of scientific methods to geographical problems? Thirdly, what improvement has been introduced into geographical education?

In attempting to take stock of the results of the exploration of the unknown and little known regions of the globe during the last half-century, starting for convenience with the year 1860, I think it is safe to say that we have to go back to the half-century which followed 1492 (when Columbus stumbled on a New World) before we find a period so prolific. The two Poles have been reached, and large additions made to our knowledge of the Polar regions. The unknown two-thirds, at least, of the Dark Continent have been more or less provisionally mapped, and all but an insignificant fraction partitioned among the Powers of Europe. Great areas of North America have been surveyed and occupied, while much has been done for the exploration of Central and South America. The map of Asia has to a large extent been reconstructed, whilst the vast unknown interior of Australia has been traversed in all directions. Even much of Europe has been resurveyed. A new department of science, Oceanography, has been created, as the result of the *Challenger* and other oceanic surveys. But let us deal with the subject in somewhat more detail, beginning at the north.

The leading episodes that have marked the progress of exploration since 1860 must be within the memory of many

of you, though probably few of the audience can go back to the forties and fifties as I, alas, can do. But time will not permit of my dealing in detail with the episodes that have marked the progress of discovery, only with the results.

What then has been the result of all the half-century's strenuous efforts to unravel the secrets of the lands that fringe the great ice-bound ocean around the North Pole. In 1860 the north coast of Greenland had never been reached, and the east coast beyond 60° N. was only known in patches. Our knowledge of the Arctic archipelago was greatly defective. What lay between Spitsbergen and Novaya Zemlya was entirely unknown; the coast of Siberia was imperfectly mapped, and the seas beyond largely unexplored. No soundings had been taken in the Arctic Ocean, and the furthest north reached was a little over 82°, a latitude reached by Hudson some three hundred years ago. Now Greenland, largely through Peary's work, has been extended to over 83° N., and the whole coast has been practically charted: the Arctic archipelago has been greatly extended; Franz Joseph Land has been placed on the map; a large island has been discovered to the north of Siberia, and another on the west of the Arctic archipelago; great additions have been made to our knowledge of Spitsbergen and Novaya Zemlya; depths of 2,000 fathoms have been sounded in the Arctic Ocean, and the North Pole itself has been located amid thick-ribbed ice. Besides these geographical discoveries, substantial contributions have been made to other departments of science which enable us to understand better the régime of these inhospitable regions in the general economy of our earth. There still remains much to be done, especially in the wide region to the north of Behring Strait, before our knowledge is complete.

Turning to the other end of the earth, there is a great gap between the work of Ross, Wilkes, D'Urville and Bellingshausen, and the outburst of enterprise in the exploration of the Antarctic continent in quite recent years. Borchgrevink and the Belgians under Gerlache began the campaign some eighteen years ago. But undoubtedly the first organised attempt on a great scale to scatter our ignorance of a continent as large as Europe, though probably of little use to humanity, was made by the great expedition under Captain Scott, whose tragic and heroic death with his four companions, some years later, places them high up on the nation's roll of honour.

Amundsen, who discovered a new and easy route, rushed in and reaped the fruits of the ten years' labours of these indomitable British explorers. Then there is Drygalski's expedition, and we have Bruce, Shackleton, and Mawson (from Australia) and Charcot on the Graham Land side. John Murray saw the land from the *Challenger* in the seventies, and with his usual insight surmised that here lay a great continent. Before the campaign began, the only big gap was that made by Ross in the Ross Sea, and along the Great Ice Barrier, with somewhat hypothetical patches elsewhere. Now it may be said truly that in the period with which we are dealing, and especially in the last eighteen years, enormous additions have been made to our knowledge of the outline, and even a large extent of the interior, of the most repellant land on the surface of the earth. It may be said that, with Ross's discovery as a basis, within the last fifteen years the whole coastline of the Antarctic continent has been laid down from King Edward VII. Land to Kaiser Wilhelm Land, considerably more than a quadrant of the circumference, and that from the observations which have been made the interior is a lofty, ice-covered plateau bordered in parts by still higher mountain ranges, with indications that in past ages a climate favourable to temperate or even sub-tropical vegetation must have existed. The meteorological work carried out, especially by Mawson's expedition, may turn out to be of practical service to meteorology in general, and to that of Australia in particular. In the interests of science, at least, it is hoped that the entire outline of the Antarctic continent will be laid down, and further investigations carried out sufficient to satisfy our natural curiosity as to the past history of this great ice-bound land.

As a contrast to the frigid regions with which we have been dealing, let us turn to the most tropical, and in 1860 the most unexplored of all the continents, Africa. One of my earliest geographical recollections is of a map of Africa somewhere in the forties and early fifties on the wall of the school of my boyhood; begrimed and faded, with the word "unexplored" in large capitals, from the Sahara to the borders of the Cape. I am afraid we boys were not sorry for the great blank without a single name to plague our memories.

As represented on the best maps of 1860, Africa from about 10° N. to about 20° S., was mainly a blank checkered here and there with conjectural and imaginary features. Livingstone

and Burton and Speke had been at work. We see the course of the Zambesi laid down, and vague indications given of Lake Tanganyika, Victoria Nyanza, and Lake Nyasa. The Nile is timidly brought down in dotted lines towards the Equator. A little bit of the lower Congo is shown with many dotted lines of conjectural tributaries joining it from various directions, but no indication given of its real course. Our positive knowledge was comparatively infinitesimal. It is not too much to say that of the eleven millions of square miles of Africa something like six millions was practically unknown, and of the remaining five millions probably not more than one million was mapped with anything approaching accuracy. The real inspiring initiative of the modern exploration of Africa undoubtedly rests with David Livingstone, who in the fifties led that ever memorable expedition across south-central Africa which placed the great Zambesi for the first time throughout its length upon the map.

But it is impossible to follow in detail the work of the multitude of explorers who, since 1860, have entirely changed the face of the no longer "Dark Continent."

The work of the great army of explorers during the half-century has changed the face of the continent and filled up the enormous blanks that disfigured the maps of 1860. While the outline of the coast remains as rigid as in the old maps, unindented by any of those great oceanic intrusions which mark the other continents, exploration has revealed a surface much more diversified than the geographers of two generations ago would have led us to expect; while the interior is mainly of a plateau character, the borderlands all round are more or less mountainous, with peaks rising in certain cases to heights approaching 20,000 feet. It has four great river systems and many subsidiary basins; a profusion of lakes, abundant forests, and park lands, and open areas that may be turned to the uses of humanity. Even the greatest desert in the world, the Sahara, has its mountain ranges and lofty plateaux, sometimes snow-clad. Unfortunately the abundant water-supply is not well distributed, though even the Sahara and the Kalahari have underground stores which may yet be utilised with good results. We have found that the continent is not nearly so hopeless as was believed from the standpoint of European settlement and enterprise. The white man has learned better how to adapt himself to tropical conditions,

while there are many regions with altitudes that afford a climate in which the European can live in comfort and wholesomeness. Still, so far as we can see at present, the resources of the continent must be developed mainly by native races under the guidance of their white brothers.

As to these white brothers, we must next consider the areas that have fallen to the share of the various European Powers. The scramble, which may be said to have begun when Stanley went out for the King of the Belgians to annex the Congo in 1879 and was virtually completed in 1886, has culminated in the absorption of the whole of the continent, except Abyssinia in the east and Liberia in the west. Britain has no need to be dissatisfied with her share, which now includes the whole of Egypt and the Egyptian Sudan. I have not ventured to add "Bothaland"; we must wait the result of the world-war, which will not be decided in Africa, but in Flanders or the Balkans. Britain's share amounts to three and a half million square miles with a population of fifty-three millions; France to four and a half million square miles, with a population of only forty-two millions; and Germany a million, with a population of twelve millions. The rest belongs to Portugal, Spain, Liberia, and Abyssinia. Of the total trade in 1914 Britain claimed £155 millions (of which ninety millions were exports) or two-thirds, leaving only one-third to the other Powers.

Much still remains to be done before our knowledge of the geography and economic potentialities of Africa can be regarded as adequate. A great network of routes and more or less provisional surveys have been laid down all over the continent, but the broad meshes between these lines have yet to be filled in. To accomplish this satisfactorily we require the services of specialists trained to scientific investigation in the various departments of science on which geography, in its broadest and highest aspects, is based, for it is only as all the raw material from all over the surface of our globe is brought together and systematically arranged that the geographical student will be in a position to work out the many problems, physical and human, with which his science has to deal.

I fear I must treat America with brevity. In the most popular American text-book of geography, a few years before our half-century, it was gravely stated that the Alleghanies of North America were the continuation of the Andes in South

America. Half a century ago, much of the region west of Lake Ontario in the north and of the Mississippi in the south was the home of the Indian, the trapper and the buffalo. Canada consisted still of Upper and Lower Canada; Victoria on Vancouver Island was only a Hudson's Bay Company's post; and so was Fort Garry, now the great city of Winnipeg. Vancouver city did not exist. How Canada has since pushed westwards you all know. Winnipeg, Vancouver, and Victoria are flourishing cities; the whole habitable country has been more or less explored and mapped, partly by individual explorers, but mainly by the Canadian Survey; waving fields of wheat have taken the place of the rank grass of the prairie; great cattle ranches reach to the foot of the Rocky Mountains; coal mines are being worked in the east and west. The area of settlement and agriculture has been pushed some degrees further north and north-west; the British Atlantic has been connected with the British Pacific by railways which make Britain independent of all foreign routes.

The caterpillar shading which indicated the Rocky Mountains from Alaska to California has given place to complicated ranges, with characteristic buttressing features, great plateaux with many offshoots, and beautiful coast ranges. All the vastly increased knowledge of Canada has led to the development of its resources at a constantly increasing rate. The whole country has been united into one great Dominion, divided into many provinces, in place of the Upper and Lower Canada of half a century ago. The population has increased from three millions to over eight millions, but Canada is capable of sustaining ten times that number. Over a hundred and ten million acres of land are occupied, and of this ten million acres are under wheat and an equal area under oats. The annual value of the mineral products alone amounts to about thirty million sterling, and of manufactures to two hundred and forty million sterling, while the total exports approach closely to one hundred millions. I give these figures as affording some idea of the vast progress made by Canada in the half-century in expanding this great country and obtaining a knowledge of its resources. But there is ample room for still further exploration and development, and during the next half-century the progress achieved must be much greater than in the past.

What Canada has done in the north, the United States

have done on a much greater scale in the south, naturally so, when one considers the difference in climate over the whole area. Not to mention the work of individual explorers, the survey men have penetrated into the remotest regions; have told a wondering world of the canyons of the Colorado, those thousand feet deep gorges which are matchless specimens of nature's sculpture; of the gorgeous beauties of the Yellowstone Park; the witcheries of the Yosemite; the great deserts which the coast ranges deprive of moisture, and the Rocky Mountains themselves with their picturesque peaks and rich upland parks.

As a result of all this activity the whole of the three and a half millions of square miles of the republic has been occupied; with the exception of remote Alaska all the old territories have been organised into states; the population has risen from thirty millions to one hundred millions; excluding Alaska, thirteen hundred million acres of the total nineteen hundred million acres have been appropriated and reserved. These figures may afford some idea of the activity of the United States during the half-century in exploring its enormous territory and taking stock of its resources.

As to South America, it was in 1860 that Bates returned, after eleven years' sojourn in the Amazon basin, mainly as a naturalist, but with abundant fresh information on the geography of that enormous river basin. Since that time a host of explorers, British, French, German, American, Swedish, have penetrated into the recesses of the continent, exploring its multitude of rivers, climbing and mapping the great Andean range, investigating the interesting antiquities of the continent, studying its natives of many types, and reporting upon its resources. The Argentine and Chile, the two most advanced of South American States, have surveyed and mapped at least provisionally their extensive territories, while boundary commissions have added much to our knowledge. The result is that the map of South America is very different from what it was half a century ago. Still, it must be said that more remains to be done in the way of pioneer exploration in South America than in any other continent except the Antarctic. At least a million square miles are practically unexplored, while a large area of the remainder is imperfectly known. In the northern basin of the Amazon very much still remains to be done. A vast extent of the

great forest area of Brazil has never been penetrated. Major Fawcett in a recent exploration in the Bolivia-Brazil border came across a forest tribe that thought themselves the only people in the world, except a hairy tribe some miles away. In Venezuela, Colombia, Ecuador, and even in Peru and Bolivia great areas are all but unknown; even the interior of the Guianas have never been adequately explored; and very much remains to be done before the magnificent chain of the Andes can be regarded as sufficiently mapped. South America has been attracting increased attention in recent years, and it is to be hoped that in the near future serious attempts will be made to complete our knowledge of a continent teeming with features and races of interest, and the abundant resources of which are capable of vast development. Unfortunately the ruling classes in the more tropical of the republics seem to lack the energy to deal adequately with the tremendous task.

If now we turn to Australia we shall find as much heroism, endurance and self-denial have been displayed in the exploration of the interior of that great southern continent as there has been in the case of Africa. Half a century ago we knew little more than the rim of the continent. Men could only wonder what lay in the unknown interior; was it picturesque mountains, flowing rivers, great lakes, luxuriant forest and pasture lands, or was it only a southern Sahara? During the last half-century the Australians have made the most strenuous and praiseworthy efforts to discover the characteristics of this great continent of which they are the stewards. All the Australian states have for years had well-organised surveys at work, and New South Wales and Victoria are now fairly well mapped, and their features and resources known.

One of the great episodes in Australian exploration is the terrible disaster that befell the Burke and Wills expedition, which, in 1860-61, actually crossed the continent from Victoria by the Stony Desert and the Mackinlay Range to the estuary of the Flinders river in the Gulf of Carpentaria; the two leaders paid for their zeal with their lives. Much more successful was Macdouall Stewart, who, in 1862, after two previous attempts, crossed the centre of the continent from Adelaide to Port Darwin along the route now occupied by the trans-Atlantic telegraph line and the trans-continental railway now under construction. He brought back good news of fine

ranges of hills, grassy plains and fair supplies of water, and altogether gave the Australians new hope of their continent. About the same time two other expeditions crossed the continent from north to south and south to north, in search of Burke and Wills, adding much to our knowledge of Queensland. The Stony Desert of Sturt was found flooded with water, and all around its borders were rich pasture grounds.

The general result of the many exploring expeditions in the eastern half of Australia has been to show that while there are great patches of desert there are extensive areas of excellent country which would be as valuable as the finest land in Europe, if only the rainfall could be depended upon; but away from the coast you cannot expect ten inches a year; occasionally there may be more, but sometimes also much less.

Still about the western half of the continent nothing was known, though in the north and north-west various expeditions had found rivers and plateaux and hills, and the country in the immediate neighbourhood of Perth and along the west coast was fairly well surveyed. The first successful attempt to cross from east to west was made in 1873 by Colonel Warburton, who, with his son, some natives, a few Afghans and a troop of camels, started from the centre of the continent, and, crossing mainly between 20° and 22° south latitude, reached the De Gray river after terrible sufferings through want of food and water. Nothing marked their dreary way but a desert of sand-hills and spinifex, with here and there a scanty waterhole.

Since then the continent has been crossed and re-crossed in all directions by Forest, Giles and their successors. The discovery of gold in Western Australia led to further exploration of that territory and an influx of immigrants adding greatly to the scanty population of half a century ago. All these expeditions, combined with the official surveys, have afforded a fair knowledge of the main features of the interior, which are much more varied than was at one time supposed. At the same time, the numerous rivers shown on the map in Central and Western Australia lack that permanency which is necessary for successful agricultural operations. But great schemes are on foot for irrigation and storage, and, as is known, the immense underground supply of water has been tapped, though, as it is not unlimited, its use ought to be

carefully regulated. The population during the past half-century has trebled, and the material progress during recent years has been so great that the Imperial Government felt justified in combining the various colonies into one great Commonwealth. Under this new régime there is no doubt that a much more detailed exploration of the continent on scientific lines will be carried out in future, with beneficial results on its development, mineral, agricultural, pastoral and manufacturing. In the annual production and commerce of the Commonwealth, gold has ceased to be the most important factor. The agricultural production alone amounts to about fifty millions sterling, the pastoral to close on sixty millions, while dairying products yield twenty millions and manufactures fifty-eight millions. Mining products amount to some twenty-five millions. The total exports are now almost eighty millions, and of that, wool alone is valued at over twenty-six millions.

This will afford some measure of the extent to which Australia has been explored during the past half-century. When we remember what man has been able to accomplish in older countries by tree-planting, irrigation and other judicious methods, there is no need to despair of Australia. At the worst there is plenty of room for the hundred millions which it is estimated—by Australians—will be the population of the continent a century hence. We may be sure there is a great future in store for our southern dominion with British energy to make the best of geographical conditions.

Although New Guinea, especially the spacious western section belonging to Holland, remains one of the few regions which affords ample scope to the adventurous pioneer explorer, still, much has been done in recent years to furnish a fuller knowledge of its interior, especially since the narrower eastern section was annexed by Great Britain and Germany. Half a century ago it was practically a blank. Into the discoveries that have been made in that magnificent archipelago that fringes south-eastern and eastern Asia, I cannot enter. Much has been done in the Philippine Islands and in Formosa by the United States and Japan to which these islands now belong. Though many additions have been made to our knowledge by British and Dutch explorers in the other islands of the great Asiatic Archipelago, still much remains to be accomplished especially by the scientific explorer.

As for New Zealand its exploration during the last half century has been carried on mainly by its well-organised survey, so that it is now to a large extent well mapped, while the peaks of its picturesque mountain ranges have been ascended by many Alpinists, with the result that the map of what is now the Dominion of New Zealand is very different from that of half a century ago. The development of its resources has kept pace with the progress of exploration, so that the value of its exports have reached the amount of £23,000,000, mainly wool, agricultural and dairy produce. The population has grown from a few thousand in 1860 to over a million.

As for the great continent of Asia itself, the primitive home of the human race, according to some, and therefore the longest known of all the continents, I can barely touch it. Unlike Australia and the New World, its great features, its matchless mountain systems, its magnificent rivers, its spacious table-lands, its sandy deserts, have long been known in their main features. But during the last half century very much has been done to fill in the details of these features, and give them precision. War and conquest have here been the great handmaids of geography. In our own Asiatic dependency, India, we have acted on the wise principle that to govern a country well, you must know it well. One of the greatest enterprises ever undertaken by any Government has been brought to a completion during the half century. Nothing is more creditable to us in our connection with India than this great Trigonometrical Survey, begun about a century ago and completed quite recently. We have measured every mile of the country; we have plotted all its mountain systems, laid down the courses of its mighty rivers, mapped its deserts and its forests and its great alluvial plains, which now form one of the great wheat granaries of the world. Many of the towering peaks of the Himalayas have been measured in their heights, and some of them scaled, and those grand glaciers, which the great Humboldt declared could not exist, have been explored and mapped; the meteorology of the peninsula, on which so much depends, has been and is being worked out on a magnificent scale, while the Geological Survey has done much to unriddle the past history of India, and reveal its mineral treasures. Our wars with Afghanistan have enabled us to map partially at least that troublesome

country. Our explorers, some of them native Indians, some of them Britons of the fine old adventurous type, have faced many dangers, penetrated into nearly every corner of Central Asia, and brought back treasures in the way of knowledge. But all round our Indian borders our modest military expeditions have always been accompanied by surveyors, British and native, who have generally returned with a rich harvest of geography. Only quite recently the age-long problem of Sanpo-Brahmaputra has been all but solved by the enterprising son of the Society's late Secretary, Captain Eric Bailey, when some thousand or two square miles of the region were surveyed and mapped. Burma and the Malay States are being surveyed; Siam has been mapped, while similar services are being rendered by France in the territories under her domination. Partly through the enterprise of individual travellers, and partly as a result of Sir Francis Younghusband's expedition, Tibet and Lhasa are no longer the mysteries that they were, and the great Brahmaputra has been traced to its source. Our faithless friend, Sven Hedin, confirmed the existence, and explored the great range beyond the Himalayas conjectured to exist by Trelaunay Saunders as far back as the seventies. But I cannot attempt to record the work of individual explorers. The High Pamirs have been fully mapped. The Kuen Lun, the Tian Shan, and these other great ranges that lie between Tibet and Turkestan and southern Siberia have been plotted in their main features. The Gobi, the Takla Makan, and other desert regions have been explored, as has the Tarim basin and the shrinking lakes scattered about in the Eastwards, while many of the marvellous remains of ancient cities and towns have been discovered. The upper courses of the great rivers, the Huang-ho, the Yangtse-kiang, and others flowing to the south, that rise in the region of the north-east of Tibet, have been approximately mapped. Progress has been made in China, though much still remains to be done in this interesting land. Japan has been as well mapped as India. Our knowledge of Mongolia and Manchuria have been greatly increased; this has also been the case with Siberia, through the surveys for the Trans-Siberian railway which has made it possible to reach Japan and Peking in about a fortnight from London. Southern Siberia itself, it has been found, may compare with Canada as a wheat-growing country. In

central and northern Siberia much still remains to be done, especially in connection with the hydrography of its great Arctic-flowing rivers. To the ever-progressing conquests of Russia we owe much of our knowledge of Central Asia. Half a century ago her borders scarcely extended beyond the Caspian shores. Little by little her explorers travelled, east and north and south, followed by her armies, until she marches with China, and is within measurable distance of India. The ancient Oxus has been traced to its source, though problems remain in connection with its old channels and the fluctuations of the Aral and Caspian, and the conditions of ancient civilisation in these regions. We know a good deal more about Persia than we did half a century ago, though there is much room here for the investigations of the qualified explorer, especially as to the present and past conditions of the Lut desert. Just half a century ago Palgrave succeeded in crossing Arabia. Various explorers have been at work since then in the west, the north, and the centre. Quite recently it was crossed again in the opposite direction from Palgrave's route by Captain Shakespear, who, alas, a few months ago laid down his life in the interests of the Empire. But for the pioneer Arabia still presents a fruitful field, especially in the great south-eastern desert, which is practically unknown. While Palestine has been adequately surveyed and accurately mapped by the Palestine Exploration Fund, and much geographical and archæological work done in the rest of Turkey-in-Asia, there is much of interest still to accomplish here by the well-trained explorer. While, therefore, the map of Asia has to a large extent been reconstructed during the last half-century, it has, with certain exceptions, been mainly the work of pioneers. There is ample room for accurate work all over the continent, especially with the various historical and economic problems dealing with the distribution and grouping of different physiological and animate types, in which Asia abounds perhaps more than any other continent.

It is more than half a century ago since Mrs. Hemans asked the question,

“What hid'st thou in thy treasure caves and cells,
Thou hollow-sounding and mysterious main?”

The question has been answered to a large extent by the deep-sea researches of the last fifty years, and on the basis

of those researches a new department of science has been created under the name of Oceanography which has now plenty of work to do. There have been numerous expeditions whose main purpose has been to explore the ocean from its surface to its deepest depths, but undoubtedly the greatest of them has been that which for three years sailed all over the oceans in Her Majesty's ship *Challenger*. The ocean has now been sounded in thousands of places, specimens of its bed have been brought up and analysed; its denizens have been captured and brought to the light from all depths; its saltness and its temperature have been tested in all quarters of the globe; its surface and under-currents have to some extent been charted, and in every way it has been subjected to the never-satisfied curiosity of humanity.

It would be hopeless for me to give you anything like a satisfactory summary of the results.

As to the depths I may say that the average depth of the Pacific is something like 15,000 feet, and of the Atlantic 12,000 feet. The greatest depth yet found in the Pacific is 31,614 feet off the Marianne Islands, while in the Atlantic the deepest trustworthy sounding is 27,366 feet near the Virgin Islands. The waters of the ocean seem to be in a state of constant circulation, cold under-currents coming down from the Poles, and warm surface current going south and north in return. One of the best known of these great ocean currents is the Gulf Stream, about the regime of which popular ideas have had to be considerably modified. As to the distribution of life in the ocean, researches of the *Challenger*, and other similar expeditions, have disclosed thousands of new forms in all seas, and at all depths of the ocean. There does not seem to be any part of the open ocean so deep, so dark, so still, or where the pressure is so great as to have effectually raised a barrier to the invasion of life in some of its many forms. Even in the greater depths many divisions of the animal kingdom are represented.

We have had revealed to us from these hidden depths great broad valleys, spacious plateaux, gently undulating ridges rising here and there into mountains, whose peaks overtop the water in the shape of the islands that stud the bosom of the sea, with here and there precipitous gorges covered with the debris of the myriads of animals that have found a home and a grave in those waters during untold years.

I need hardly remind you that the many island groups which stud the bosom of the spacious Pacific have, like Africa, been parted among the Powers of Europe, as well as the United States, with the result that much has been done to add to our knowledge of the islands and their vanishing peoples.

The accompanying maps will show roughly by different tints the progress which I have tried to outline in the exploration of the globe during the half-century.

The raising of the standard of geography during the last thirty years, and the increasingly rigid application of scientific method to geographical research and to the practical application of its results, has had considerable effect on the organisation and equipment of exploring expeditions, and of the type of men selected to carry out exploring work. So long as a great part of the world was very much of a blank we welcomed any authentic information that could help to fill it up, even although the explorer was a pioneer without any special training. But now that the main features have been filled in with varying degrees of accuracy, we must insist that explorers shall have a training adequate to the conduct of their work on scientific lines. Dr. de Filippi's recent expedition to the Karakoram may be taken as a model of what the expedition of the future should be, with its ample staff of specialists in every department of science involved in the work the expedition had to accomplish, and its complete equipment with the latest instruments necessary to give the most satisfactory results. But this condition has been increasingly recognised in recent years.

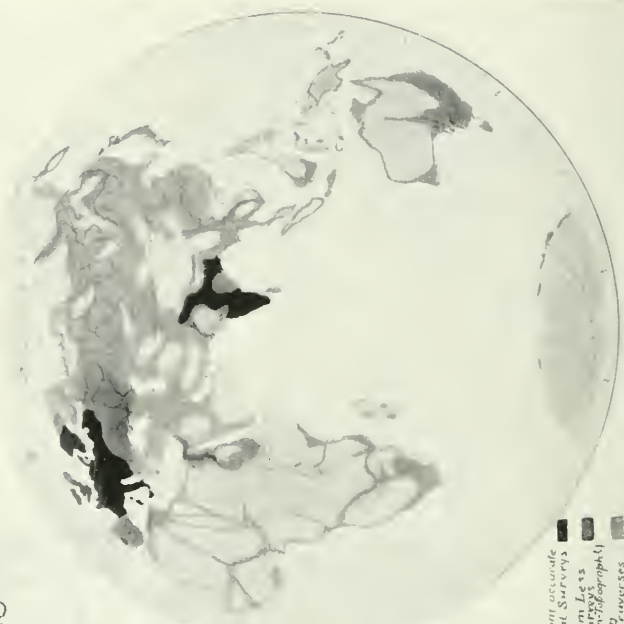
This is the place to refer in a word to the great service rendered to exploration, and to geography in general, by photography since it began to be applied to this purpose. The old wood-engravings, and even plates, which were used for illustrations in the pre-photographic days, while sometimes wonderfully good from the artistic, and even from the geographical standpoint, could seldom compete in the latter respect with the photographs taken by a discerning eye. I remember well the difficulty in persuading some of the more conservative members to permit the introduction of lantern slides at the meetings of the Royal Geographical Society as being too trivial and too childish for a serious scientific body;

I need not remind you of the universal use now of this method for scientific lectures of all kinds.

One other feature which has marked the development of geographical work during the half-century might be pointed out. Fifty years ago geographical enterprise was the work of individual explorers, sometimes backed by their governments; but in recent years a remarkable circumstance in geographical method has been the growth of international co-operation, as shown in the international congresses and international bodies, such as the International Geodetic Association, the International Meteorological Committee, the International Council for the Study of the Sea with special reference to fisheries; the international map of 1:1,000,000; and the great bathymetric map of the Oceans undertaken by the Prince of Monaco with an International Committee.

I have thus endeavoured to present to you, I fear in a very summary fashion, the results which have been achieved during the past half century towards the completion of our knowledge of the home of the human race. I think you will admit that so far as results are concerned it will compare favourably with any other half century in the history of exploration. I have had necessarily to confine myself to what I may call the superficial results of all this activity. But apart from the fact that vast areas of previously unknown lands have been brought within human ken, and provisionally mapped, abundant additions have been made to all the aspects that come within the sphere of geography. Many departments of science have profited by these explorations—the character and distribution of physical features, of minerals and vegetation, of animal life, of climatic and economical conditions, of man himself in his various races and varieties. Of some of the results of all this knowledge you may have been able to form some idea from the figures I have given as to the growth of the population and the greatly enhanced value of the results of economic development. For the more detailed and precise is our knowledge of the habitable lands of the globe, the more are we in a position to turn them to the best account for the benefit of humanity. As I have pointed out there is still a certain amount of pioneer work to be done, especially in South America, but the explorer of the future must be very differently equipped from the pioneer of the past. Something more is wanted now than a daring

1860



Mapped from accurate
 Topographical Surveys
 Mapped from Lewis
 and Clark's Journals
 Mapped from Topographical
 Reports
 Mapped from
 various sources
 and Sketches
 Entirely Unsurveyed

1915

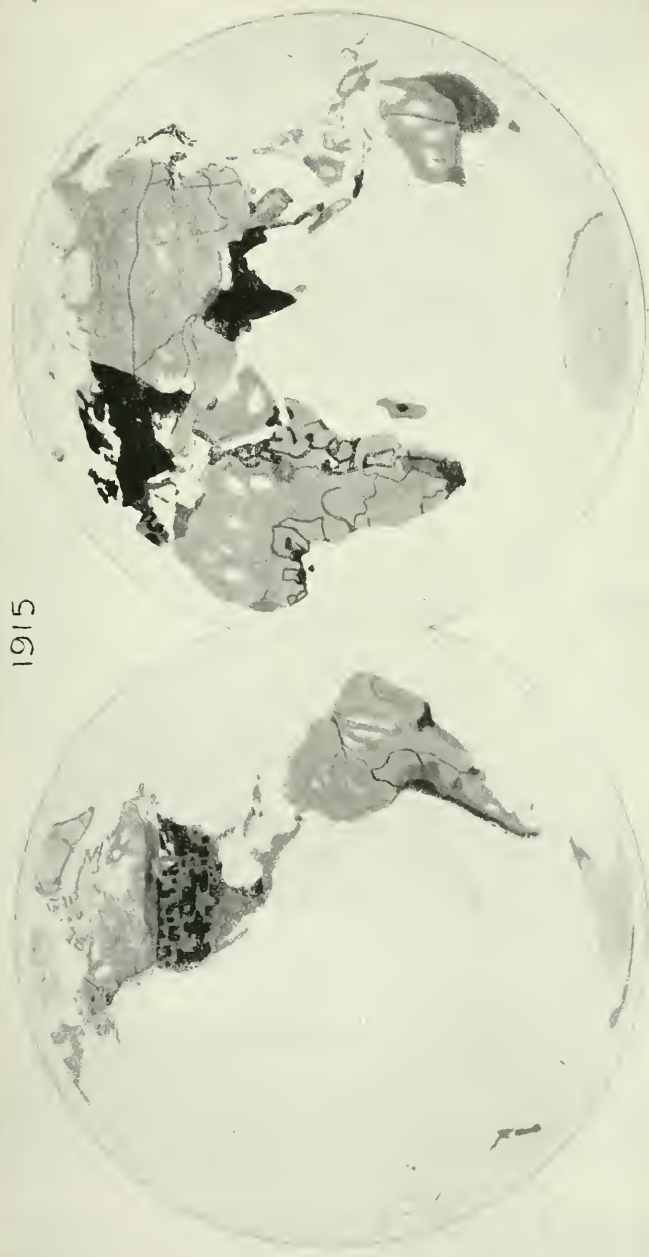


PLATE I. The World in 1860 and 1915, comparing the extent to which it had been surveyed.
(From Maps by Mr. E. A. Reeves, F.R.G.S., kindly lent by the Royal Scottish Geographical Society.)

spirit and a geographical instinct. What we now want, even for pioneers, are men who have been thoroughly trained, and who will be content to devote themselves to a limited region, and work it out in all its details of feature, and geological character and meteorology, and animals and plants; ever keeping in mind that man is the centre of all, and that we only reach the last stage of the problem when we have worked out the action and re-action that is constantly taking place between man and his topographical surroundings. If in the solution of such problems as these there is as much activity shown in the next fifty years as there has been in the past half century in the work of pioneer exploration, there will not only be an unprecedentedly rich harvest for science, but also, I venture to think, magnificent results of bearing on the social and individual welfare of man, who cannot but benefit from a better knowledge of his geographical settings.

In the vast amount of the work of exploration during the half century, the British Empire, I think, may claim the lion's share.

“ We sailed wherever ship could sail,
We founded many a mighty State,
Pray God our greatness may not fail
Through craven fear of being great.”

I fear I have left little time to deal with the other two sections of the subject—the progress that has been made in raising the standard of geography as a department of scientific research, and the improvements that have been introduced into geographical education. Until about thirty years ago I fear geography was not treated seriously in either of these aspects. Long before that, in the early seventies, attempts were made by the Royal Geographical Society to induce the Universities to recognise the subject in their curricula; but the Society was politely flouted; the subject, we were assured, was beneath the dignity of University recognition, and was only suited for elementary schools. At this we need not be surprised when we examine the geographical literature of the period. It is true, that in certain of our great narratives of exploration—Franklin, Ross, Darwin, Bates, Wallace, Livingstone, and others—the scientific side of the subject was dealt with seriously, but the few works which existed on general geography were entirely descriptive; no attempt was made to show the relations which existed between the various

distributions over the earth's surface and the interaction between these and the human beings who had to adapt themselves to the geographical conditions or modify them for the benefit of humanity.

In 1884 the Royal Geographical Society decided to make a thorough inquiry into the position of geography at home and abroad; and with the results of this inquiry they again approached the Universities, this time happily with success. Schools of Geography were established at Oxford and Cambridge, and in time lectureships in the subject were instituted at the Universities of Edinburgh and Glasgow, London, Liverpool, Manchester, Birmingham, Reading, Sheffield, Aberystwyth. It was just before this that the Manchester Geographical Society was founded, followed immediately by the Royal Scottish Geographical Society at Edinburgh, with branches in Glasgow, Dundee, and Aberdeen, and later by similar societies in Newcastle, Liverpool, Southampton, Leeds and Hull. Thus geography was raised to an altogether different platform in this country from the lowly position she had previously occupied; she was placed on a level with the subject in Germany, though that pushful country had the start of us by many years, as she has had in other directions, and a long leeway has to be covered. But we have been making headway. Apart from the purely educational work carried out by the Universities, a beginning has been made in the work of geographical research. Both at Oxford and Cambridge, at the London School of Economics, and I believe at Edinburgh and Glasgow work of this kind is encouraged. On the University programmes we have such heads as the Principles of Geography; Survey of the Natural Regions of the Globe; Land Forms and the Morphology of the Continents; Meteorology, Climatology and Oceanography; Human Geography in its various phases; Geographical Methods of Notations, and so on. To the University tutor, the school-master, the text-book compiler of thirty years ago, most of this would have been an unknown tongue. Examples of what may be regarded as geographical research work have been forthcoming from trained men like Mill, Mackinder, Chisholm, George Adam Smith, Herbertson, Grant Ogilvie, Roxby, Miss Newbigin, and others on this side, and by Davis, Huntington, Miss Semple, Brigham, and others in the States, which may be said to have been inspired from the mother

country. Much good work has been done by the various students in the geographical distribution of vegetation in this country. As samples of scientific exploring work I might refer to Sir John Murray's investigations of the Scottish lochs, Mill's survey of a region in Sussex, Günther's researches on the Italian coastline, Hogarth, Ramsay, and others in the Near East, Willcocks in Mesopotamia, Filippi, Stein, Caruthers, and Huntington in Central Asia, Hamilton Rice in South America, Scott, Shackleton, Bruce and Mawson in the Antarctic. All this is a good beginning, and there is every reason to hope for still further work of this kind in the future, if those responsible for geography at our Universities will do their duty.

You still find some scientific men in England who deny that geography is a science or can ever be a science, because for one thing it is a *graphy* and not a *logy*. It is remarkable if geography is the one thing in the universe that cannot be dealt with on scientific methods, producing a body of knowledge as systematically arranged as that included under geology, meteorology, astronomy, or engineering, and other sections of the British Association. Personally, it does not irk me whether geography is admitted to be a science or not. It is a department of investigation which deals with a field untouched by any other department—the earth as the home of humanity. Like other departments of inquiry, it can collect its facts and draws its inferences on scientific methods, with results which in many cases could be cited in the geographical output of Germany, and happily, as I have stated in a few instances, in our own country—of the first importance towards the solution of problems intimately associated with human life and activity. To quote from the Anniversary Address, in 1892, of the late Sir Mountstuart Grant Duff, President of the Royal Geographical Society: "Whether it is taught or not taught in schools and universities, geography must in the nature of things rule the territory in which the sciences relating to organic life, from history down to the structure of the humblest animate thing, meet the sciences which have to do with inorganic nature. Call it a *graphy* or a *logy*, or a *Kunde*, or what you please, it remains the body of knowledge which has to do with the theatre of the activity of man, and all things that have life. We may stunt and injure the activity of the next generation by refusing to teach it, but eventually

it must obtain the position which the greatest of living systematic botanists, Hooker, claimed for it in 1886. 'It must permeate,' he said, 'the whole of education to the termination of the university career, every subject taught having a geographical aspect.'"

With such authorities as these on our side, we have no need to be ashamed of the work our science has performed in the past and is capable of performing in the future. In this country, we are comparatively new to the work, only feeling our way, as it were, only trying to find out exactly what are the conditions under which our line of research will produce the best results, what are the limits within which we must work. It is true that geography is the mother of all the sciences, and though her numerous children have long ago set up for themselves, still she has more or less intimate relations with many of them. All the same, she must not be too grasping; she ought to form a clear idea of what she has a right to, what are the limits of her field of operations. To vary the simile, the geographers in this country have been moving into a much more spacious mansion; we have hardly had time to put our house in order; we may find when we do so that we have not room for all the furniture that some of our friends would like to squeeze into it. Anything like overcrowding is unnecessary and would be embarrassing. Ellsworth Huntington, one of the most active and most original of our younger geographers, whose imagination may perhaps want a little of the taming that comes with years, has the fullest belief in the influence of geographical conditions on history and other human activities; but he maintains that the claims made in this respect are often too vague to convince the sceptical historian. What we want, he says, is a more precise statement as to the nature and amount, the quantity and quality, in each case of this environmental influence compared with various other elements. Probably we can never reach mathematical precision in this respect, as we might do in other departments of our subject; but it would be a splendid exercise in geographical research and in mental training for the qualified student of the subject to tackle the problem in certain specific instances. A group of physical features might be taken—say the Alps, or the Himalayas, or the deserts of Central Asia, or the Sahara—and the question of their control over human distribution and human activity worked out with

as much precision as possible. Or a particular country or region might be selected and the control which geographical conditions have exercised on its history and development, as compared with other factors in the problem, be indicated.

As to the progress which has been made in geographical education outside the Universities during the period, let any one who is old enough recall the text-books of thirty years ago with their dreary list of names and little more,—names of capes, names of bays, names of mountains, names of rivers, names of lakes, names of towns, all completely isolated, as if they had no sort of relation to each other, nor to human beings who had to live and move and have their being among them. We had such tags as Edinburgh, Leith, Portobello, Musselburgh and Dalkeith, all on the Firth of Forth; London on the Thames; Colchester on the Colne, famous for its oysters; Peterborough on the Nen, near which is Fotheringhay Castle, where Mary Queen of Scots was cruelly beheaded, and suchlike items. No wonder that geography was rejected and despised by the Universities if this kind of thing was all it had to say for itself. Then there were the featureless atlases and wall maps, the value of which was estimated mainly by the number of names which they contained. Pictures, photographs, stereos, the lantern, were regarded as too childish to be used for serious educational or scientific purposes; while as for the many other appliances now available for geographical education, no one seems to have thought them possible. Out-of-door work in those days was undreamed of.

Need I remind you of the change in all these directions which has taken place during the last thirty years? Contrast the conditions then and now. It might seem invidious if I referred to any particular text-books or treatises, or maps and other appliances. I am sure it is unnecessary before an audience like this. The ever-increasing series of treatises and text-books which are being produced, and for which, therefore, there must be a demand, are no doubt familiar to you all. Some may be open to criticism, but all, from the most bulky and elaborate down to the modest elementary text-book, are on a totally different plane from those of thirty years ago.

But text-books and maps are not everything in geographical teaching, and happily in some of the Universities, and in a considerable number of secondary and even elementary schools outdoor work is carried on.

Geography, like geology, has to deal with a concrete earth, and not merely with maps. It has surface features of all kinds to investigate, and the life that is lived amid these features, and is to a considerable extent conditioned by them. It is the duty of geography, as it is of geology, to investigate these conditions on the spot, and to work out the problems suggested by them. This department of geographical work is still in its infancy, a mere collection of local facts and statistics is not enough; co-relations ought to be investigated and deductions as precise as possible made as to the results of the interaction of the various factors.

A new epoch in the history of geographical education in England may be said to have begun when the Board of Education issued its Regulations for the Teaching of Geography in Secondary Schools. Perhaps the most important point in the new regulations was that a definite number of hours a week—not less than two periods of school work and one of home work—were to be allotted to geography in secondary schools. Provision had to be made for a four-year course of the work, and the course had to include the geography of the whole world, so that the custom of keeping the pupil at work on one or two particular continents, according to exigencies of examinations, until he left school was discountenanced. Particular attention was given in the Board's circular to the importance of practical exercises, such as "worked out problems, together with original maps and plans," in geographical instruction. Consequence had to be connected with cause, and reasons had to be stated with facts, instead of presenting lists of place-names, rivers, communications, and so on, as catalogues to be learned without being understood.

When the Board's Regulations were issued, teachers who had specialised in geography were few, and the Regulations would have been a long time coming into practical effect if suitable manuals had not been forthcoming. The Board defined the spirit of the teaching it desired to establish, and gave the outlines of the scheme, but it left the actual working-out to teachers themselves; and in most cases they had to obtain their guidance from manuals and text-books. Much had already been done by the University Extension Lectures to teachers. The teaching of the subject throughout the country now underwent a change on account of the new conditions: from being classed as memory-work which could be put into

the hands of any teacher, geography became a reasoning subject requiring individual work by the student and sound knowledge by the teacher as much as any other subject taught on scientific principles. Too much attention was perhaps paid at the outset to the working of practical problems and exercises, but this has now righted itself, and the human note is not forgotten while the scientific method of arriving at it is followed. What is more important than anything else is that the standard of work in geography is steadily rising. The subject is being treated more and more on a regional basis, and the work is consequently gaining in intelligence.

The programme for instruction for elementary schools has been greatly improved on the best lines, and where teachers have been adequately trained to deal with it intelligently the results are a great advance on what passed for geography thirty years ago. But in the case of the younger pupils, I fear it is difficult to get them to do more than to read narratives. In the upper classes of these schools, however, more systematic work is prescribed in the official programme, and I believe the whole tendency is towards an improvement upon the methods and outlook of previous years. The Inspectors of the Board of Education consider that geography is now on a much better footing than it was, and is often intelligently taught. Much depends upon the training which students in Training Colleges receive before they are turned out to carry on the work of education.

In certain institutions facilities are provided for Training College students going through a course of instruction in geography, with opportunities of actual practice in schools. I am not sure that this method is quite satisfactory; it would be well if all Training Colleges were as fully equipped for geography work as they are in other departments. In no class of school can geography be satisfactorily taught on modern lines unless the teachers are as seriously trained in that as they are in grammar, arithmetic, or any other essential parts of their course. In certain Training Colleges the subject is in charge of geographical specialists. This ought to be the case in all Training Colleges, as well as in the Universities from which the supply of teachers for secondary and higher schools are drawn. But if the progress is as marked in the next quarter of a century as it has been in the past, there can be little doubt that the existing deficiencies will be

removed, and geographical education will be on as satisfactory a footing in Britain as it is in Germany.

But time forbids me to go further. I hope I have succeeded in showing that during the last thirty years geography has grown in stature and in strength in this country; that, in fact, it has reached man's estate, and that both in education and in research it is trying to do a man's work. It has still much to learn that can only come by experience, but it is bound to come if we work in the future as in the past, and that all the more rapidly and successfully in proportion to the increasing number of workers. The Royal Geographical Society has itself extended not only in numbers, but in varied activities, during these years. Its staff has been quadrupled to keep pace with its work; the scientific side of the subject receives more and more attention. The efforts of the parent Society are effectually supported by those younger Societies which have grown up in various great centres. It is often stated that the work of Geographical Societies is nearly completed, that they will soon have had their day and cease to be, for the world is being rapidly explored and mapped. There is plenty of work still to do in exploration and mapping, and when that is complete the real work of geography and Geographical Societies will only begin. The explorer and map maker only lay down the foundations of the subject; it will remain for generations of geographers to rear thereon a stately structure fitly representing "the kingdoms of this world, and the glory of them."

THE MAPPING OF THE EARTH—PAST, PRESENT,
AND FUTURE.

By EDWARD A. REEVES, F.R.A.S., F.R.G.S.

(The Presidential Address delivered to Section E, Geography, at the Newcastle-on-Tyne Meeting of the British Association for the Advancement of Science, and taken as read at the Meeting of the Society held in the Geographical Hall on Tuesday, October 17th, 1916.)

WE meet to-day under exceptional circumstances. The great War is affecting us all; those of us who are not actually engaged in it find that our lives are more and more under the influence of the great struggle that is now taking place, and are being called upon to do what we can to carry on the work of the men who have gone, as well as our own. This is the explanation of my presence here to-day. Mr. D. G. Hogarth, who was to have been our President this year, has been compelled to resign owing to his absence from England on important military duties; and a week or two ago I received a letter from the Secretary of the Association asking if I could help out of the difficulty in which our Section was placed by taking the chair during the meeting. Well, there seemed nothing else for me to do but accept, so I am here, and will do the best I can to fill the gap. With your kind indulgence, and the invaluable help and guidance of the recorder, secretaries, and committee, I trust we shall manage to get through somehow without bringing discredit on ourselves.

You will understand that, as the notice was so short, I have had no time to prepare an address such as I should like to place before you; and that which I shall now give has been hastily put together during a few days' holiday at the seaside, from notes and jottings I have recently made for other purposes, combined with such remarks as I feel may be appropriate to the circumstances and conditions under which we meet.

This is a great testing time—a crisis in our history when theories are put to practical trial, and I fear many of them will be weighed in the balances and found wanting. Scientific training is specially being tested, and almost every branch of human knowledge has, either directly or indirectly, been

called upon to do its utmost in connection with the great War. This is no less true of surveying and geography generally. There has always been of necessity a close connection between military operations and map-making, and it is not too much to say that one of the essential conditions of successful warfare is a good and accurate knowledge of the geographical features of the theatre upon which the operations have to be carried out. Many a battle has been lost in the past, as we know to our cost, through imperfect topographical or geographical knowledge. The South African campaign, without referring to any others, produces more than enough evidence of the serious results ensuing from imperfect maps; and at the present time the general staffs of all combatants seem more than ever alive to the importance of this subject.

There are various ways in which this War will affect the map-maker; not only will new boundaries have to be surveyed and laid down; but outside of Europe districts will have to be mapped of which little information has hitherto existed, so that, after all is over, our present maps and atlases will be out of date, and the publisher will find himself called upon to produce new ones.

It therefore appears to me that this is a suitable occasion for taking stock of our position, and I will endeavour to give you :

- (1) A brief general summary of what has been done in the past towards the mapping of the earth's surface;
- (2) a sketch of how things stand at the present time; and
- (3) finally add a few remarks upon future work, specially as regards instruments and methods.

You will perceive at once that this is a large subject, and in the time at my disposal I shall only be able to deal with it in the briefest possible manner.

The acquirement of knowledge has always been progressive, sometimes moving slowly, at others more rapidly, but ever advancing; and this is specially true of the subject we have to consider. Our present knowledge of the earth, its form, size, the configuration of its surface features, their measurement and representation on maps as we see them to-day, are the result of many centuries of strenuous endeavour and conquest over obstacles, and at times almost insurmountable difficulties, the record of which constitutes a striking

monument to indomitable courage and perseverance such as cannot be excelled in the history of mankind.

Of all branches of human research and discovery that of geographical exploration and representation of the surface features of the earth is doubtless one of the oldest; in fact, it is difficult to imagine a time in the history of intelligent man when it did not in some manner or other exist. The earth's surface is, by the nature of things, man's present dwelling-place, and, however high and far he may soar in imagination and thought, as to his bodily presence, his movements and operations are restricted to the crust of the comparatively small planet he inhabits. By his very nature man is an adventurer and restless wanderer; and, since his physical constitution does not permit of his travelling more than a comparatively few feet vertically, his only chance of expansion is laterally or horizontally; and geographical investigation and measurement became a natural consequence.

From the earliest days there would arise the need of some sort of plans and maps; there would be boundary questions to settle, and the limits of pasture-lands, and irrigation rights, mining-claims and other matters would call for maps of some kind, however rough they may have been; so it is quite impossible to say when surveying commenced. It certainly must be one of the oldest departments of knowledge, and, like all others, has slowly advanced as the centuries have passed and greater accuracy was required until it has reached the refinement and precision of the present day.

Probably the earliest attempts were those which naturally resulted from the necessity of representing in some kind of plan the limits of private property, and several interesting examples of this have been brought to light during archaeological investigations and discoveries in Egypt and other ancient sites.

A careful reader of the account of the dividing of the land of Canaan among the tribes of Israel can hardly fail to come to the conclusion that Joshua had some sort of map of the land before him when he proceeded to apportion the various districts, the boundaries of which are so minutely and carefully described; and it is also more than probable that he and others who had been sent beforehand to spy out the land 'had in view quantity as well as quality,' as Gore says in his

'Geodesy,' which implies some kind of rough survey and sketch map.

At a later period we have the vision of the man with the measuring line in his hand, measuring out his thousands of cubits, apparently much as a chainman does his work to-day.

So long as the district concerned was of no great extent there could have been little difficulty about making a rough plan or map of it. For lineal measurements the most natural units would be the lengths of various parts of the human body, the cubit, the pace, the foot and the span were evidently amongst the earliest standards of all, and most of these have remained in use until this day. With these, and an elementary knowledge of some of the simpler geometrical figures, it would be easy for quite useful plans to be constructed, as indeed we know was the case.

The longer distances were reckoned by the time it took to travel from one place to another, days' journeys, &c.; and later on in stadia, of which it is generally assumed that there were 600 to a degree according to the ordinary Greek measure.

When distinctive features were visible it would be comparatively easy to map roughly a route travelled, much as a man in the present day can make an approximate sketch to show any journey he has taken, even without a compass or other instruments; or natives have been able to draw rough sketches to explain to explorers the direction of any coast line, or course of a river. One of the most recent examples of this is the map reproduced by Mr. Beaver, which was drawn in the sand by a native of Papua to show the relative position and names of the various tributaries of a river he was exploring (see 'Geogr. Journal,' April, 1914).

Long before the magnetic compass was known, at any rate in Europe, navigators and travellers had to find their way somehow, often through little-known regions, and, when they had no landmarks to direct them, would have to seek some other means of guidance. Early nomad peoples of the desert would soon become acquainted with the heavenly bodies and their general movements and positions, and would naturally turn to them for the guidance they sought. Their positions at certain times and seasons would, through being continually observed, become quite familiar, and so doubtless before any instrumental astronomical observations for fixing positions

were made, men learned to march and steer their ships by the sun by day and the stars by night. It is interesting to note that the art of marching by stars has been considerably revived in the last few years, specially in the rapid movement of troops at night.

So long ago as the seventh century B.C., Thales taught the Ionian sailors to steer by the Little Bear, as did the Phœnicians.

One of the most interesting exploring expeditions of ancient times was that of Pytheas, the discoverer of Britain, in the third century B.C., who had not only learnt to sail by the stars, but determine the latitudes of points throughout his voyage by astronomical observations, made with a gnomon or sort of sundial, with which he seems to have fixed the latitude of Marseilles with far greater accuracy than might have been expected.

The gnomon used by Pytheas was probably of the earlier form, which consisted merely of an upright rod in the centre of a flat disc, but Aristarchus, in the third century B.C., introduced a decided improvement in the design of this interesting old instrument, which deserves to be borne in mind by all surveyors, since it seems to have been the first by which angles could be measured directly without computation. He substituted for the flat disc, or plate, a hemispherical bowl, in the centre of which an upright rod was fixed equal in length to the radius of the bowl. Concentric equidistant semi-circles were drawn on the interior of the bowl, which became a scale for the direct measurement of angles of altitude as indicated by the shadow of the rod or gnomon.

The voyage of Pytheas is of special importance, since it shows that even at that early date serious attempts were made at carrying out geographical exploring expeditions, by sea at any rate, on scientific lines.

The first record of anything that could be considered as the beginning of geodetic surveying was the well-known attempt of Eratosthenes to ascertain the size of the earth by the measurement of an arc of the meridian. This wonderful old philosopher was born in Cyrene in B.C. 276, and was so noted for his learning that he was put in charge of the famous library at Alexandria. The method he adopted was much the same in principle as that upon which geodesists at the present time

work, but it seems impossible to say how near the truth his results were, as there is a doubt as to the length of the stadium he used.

The subject of the true form and dimensions of the earth is a most important one in many respects, and considerably affects survey questions, since it must form the basis of all exact measurements on the earth's surface. Right on to the present day geodesists have been working at it, and although they have brought down the probable error in the measurements to a minimum, yet even now the question cannot be taken as finally settled.

As regards the maps of very early date, it has always been a question as to how far they were the outcome of mere information collected by travellers without any attempt at instrumental measurement, and how far they were based upon some kind of route-surveying and astronomical determinations. At sea, as has been shown, occasional observations were made to determine latitude, but the actual charting of the coast-line, it is more than probable, was sketched in in the roughest possible manner, with little assistance from any kind of instruments. After repeated voyages the navigators would naturally obtain some acquaintance with the general configuration of the coast-lines and be able to draw a fairly accurate chart. These rough sketches were sent from one to another and copied by hand by cartographers; so in course of time quite a good representation was produced. It is indeed remarkable how accurate some of these old charts were. A rough latitude could always be obtained from observation, but it was quite another thing with longitude. Even at the present day there is far more uncertainty about a longitude observation than a latitude, and in early days, before the construction of accurate chronometers, to obtain the difference of time or longitude between two places was a problem which could not be satisfactorily solved with the rough instruments and tables available. Consequently the longitudes on early maps were, as a rule, very wrong. They were generally much too great, as the tendency was, as it is indeed at the present time, to exaggerate the distance travelled.

As might be expected, now and then serious mistakes seem to have been made in the fitting together of sections of charts received from various sources. This was probably due to the fact that in many cases they were rough copies from other

copies of the originals, and, with no proper means of settling the orientation, the chart would, as likely as not, be fitted on to another at quite a wrong angle. This is doubtless the explanation of some of the grosser errors on many of the old maps. For instance, in the early editions of Ptolemy's maps, 1462(72)–1490, to the north of England there is a remarkable mass of land running something like east and west, and projecting a long way in the former direction. This is, of course, meant for Scotland, but it is difficult to see how it could have got so wrongly drawn. Yet if you suppose the whole mass turned round at right angles, so that the part that goes to the east is placed to the north, you get a much better representation. There seems little doubt that somehow or other the whole thing has got wrongly joined on to England. In later editions of Ptolemy it was corrected.

The best-known of all the old instruments is the Astrolabe, which is generally supposed to have been invented by Hipparchus about B.C. 150. Ptolemy, and many others after him, introduced modifications in it, some of which were doubtless improvements, while others, as is the case with many so-called improvements in more modern instruments, were of doubtful value or merely unnecessary incumbrances. Divested of all elaborations, the astrolabe consisted of a somewhat heavy metal ring suspended from the thumb, or, in the case of the larger instruments, hung on some form of tripod arrangement. Pivoted at the centre was the movable sighting rule or alidade, and the altitude of the sun or star was read off on the graduated circle round the circumference of the disc.

During the mediæval ages things were at a standstill, or rather went backwards, as regards all scientific pursuits, at any rate in Europe. This in a special manner affected geography and map-making. The advance that had been made by the Greeks was arrested, and the knowledge they had gained was lost sight of; instead of maps being improved by more accurate surveys of explorers and travellers, they were frequently drawn in monasteries by monks from imagination, more or less distorted by religious bigotry. Cartography fared somewhat better in the hands of the Arabs, but many of the maps seem to have been constructed under the impression that the outlines of all parts of the world must be formed by straight lines and arcs of circles, drawn with a

ruler and compass, so that they are of little real value. There were, however, a few notable exceptions.

It was not until the latter part of the fifteenth century, the time of the great Portuguese and Spanish discoveries, that any real advance was made, but then Europe seemed to awake from a long sleep, and a grand new start was made.

One of the first acts of King John II. of Portugal (1481-95), whose memory deserves to be equally held in respect with that of his great uncle Prince Henry, was the calling together of the Committee, or 'Junta,' of learned men to consider the best means of finding the latitude when the Pole-star was too low to be of service, to decide upon the most approved form of instrument for the taking of observations, and to furnish suitable tables of declination, &c., for the computations. Equipped with the new tables, which may, perhaps, be considered the first Nautical Almanack, and the simplified astrolabe, the Portuguese navigators started on the famous voyages, with a much better chance of properly fixing positions than their predecessors. The vernier had not yet been invented, and so the difficulty of obtaining accurate readings of the circles was still considerable. To overcome this difficulty it was decided to construct astrolabes with very large circles, and the instrument carried by Vasco da Gama in his famous voyage round the Cape in 1497 had a circle which measured just over two feet in diameter. The size of the instrument certainly made it unwieldly, and so it was necessary to suspend it from some sort of stand, which meant that it could not have been used with much success on board ship. Vasco da Gama seems to have been fully alive to this, and so we find him, when he arrived at St. Helena Bay, not far from the Cape, bringing his instrument on shore and fitting it up on a stand. His observation and method of obtaining the latitude of this spot is of considerable interest, and may perhaps be taken as a fair example of the kind of work that was then done.

The sun's meridian altitude measured was $76^{\circ} 20'$, which gave a zenith distance of $13^{\circ} 40'$. The declination found from the table was $19^{\circ} 21' S.$, so by adding this to the zenith distance the resulting latitude was $33^{\circ} 0' S.$ I have recently tried to find out how near this was to the true latitude, but it seems to be difficult to say exactly where the instrument was erected. If we take the head of the bay as the spot, the error is apparently $13'$, since the latest Admiralty chart gives $32^{\circ} 47' S.$

This error appears to be somewhat larger than might have been expected, but still, taking all things into consideration, it was not so bad after all. I have on several occasions made altitude observations with rough home-made instruments of the astrolabe type, to see what could reasonably be expected, and have found that with care it is possible to get a latitude with an error not exceeding $5'$ to $7'$, taking a mean of several readings.

The difficulty of taking anything like accurate observations at sea was for centuries a very serious one, and long before the invention of the reflecting quadrant or sextant many were the attempts to devise some instrument for accomplishing this.

Next to the astrolabe, and various forms of quadrants with a sighting arrangement and plumb-knob, the old cross-staff came into use. This consisted of two rods or pieces of wood at right angles to each other. The shorter piece had a hole in the centre, and was made to slide along the other. The eye was placed at the end of the long piece, and the sliding piece or cross moved along until one end of it cut the sea horizon and the other the sun. The altitude was then read off on the long staff, which was graduated for the purpose. This was essentially a seaman's instrument, and was in common use about 300 years ago—in fact, until the famous old Arctic explorer, Capt. John Davis, of the sixteenth century, improved upon it by bringing out his 'Back-staff,' which enabled a man to take altitudes with his back to the sun instead of half-blinding himself by looking straight at it.

With instruments such as these only the roughest measures could be obtained, and it was not until the ingenious invention of the reflecting octant, suggested first of all by Sir Isaac Newton, that anything approaching accuracy was possible. Hadley's quadrant was the first of such instruments to be put into actual use, but there is no doubt that the idea should be ascribed to the famous Sir Isaac Newton, although the instrument was probably independently invented by Hadley.

With the invention of the sextant, or its predecessors the octant and quadrant, rapid progress was made in improvements in navigation and surveying instruments.

The introduction of the Nonius by Peter Nuñez in the middle of the sixteenth century, and later of the Vernier by the Frenchman Francis Vernier, which, owing to its sim-

plicity, soon superseded the former, were of great importance, since it was no longer necessary to construct the enormous large arcs and circles which had hitherto been indispensable to give anything like accuracy.

The magnetic compass not only made an enormous difference in navigation and exploration by sea, since it enabled the sailor to launch boldly out into the unknown oceans with confidence, but it soon began to leave its mark on land-surveying and geographical exploration. Much has been written on the invention of the compass, and many have been the disputes upon the subject, but it was certainly in use in Mediterranean countries of Europe as early as the twelfth and thirteenth centuries. The date when it was first used for land-surveying is not known exactly, but in Europe it was probably about the early part of the sixteenth century.

For the filling-in of the topographical features early forms of the plane-table, or their prototypes the trigonometer and graphometer, came into use in the sixteenth and seventeenth centuries. Besides these the surveying perambulator, much as is used at the present time, was a favourite instrument in measuring distances along roads, and many of the road maps of England before the Ordnance Survey were made by its means, combined with compass-bearings and circum-factor angles.

It is supposed that Ptolemy was fully alive to the fact that it was not necessary to actually measure the whole length of an arc of the meridian, but that some parts could be computed, or perhaps graphically obtained, much as is now done in plane-tableing; but, so far as we know, the first to introduce triangulation from a measured base and angles was Willebrod Snell, a mathematician of the Netherlands, who lived in the seventeenth century. The account of his triangulation for obtaining distance between Alkmaar and Bergen-up-Zoom, in Holland, is well known, and it is not necessary for me to refer to it in detail here; but its importance cannot be over-estimated, since it laid the foundation for all future work. Much has been done in later years, but this has only meant the improvement of Snell's system, the perfecting of instruments for the measurement of angles and bases, and more refinement in the computations.

Of all the instruments used by the surveyor, there is doubtless none more important than the theodolite, which seems

to have been first of all invented by Leonard Digges. His invention is described in his book on surveying, which was completed by his son and published in 1571.

There is an interesting old theodolite of much the same design in Bleau's famous Dutch Atlas of the latter part of the eighteenth century.

The 'common theodolite,' as it was called, since it had no telescope, carried by Mason and Dixon to the United States, and used by them in their survey of the boundary between Maryland and Pennsylvania in 1763-9, is now in the R.G.S. Museum. It was made by Adams, of London, and was evidently only intended for observing horizontal angles. It resembles what is generally known as a circumferator more than a theodolite. The famous Ramsden theodolite, which was used on the primary triangulation of the British Isles and later on in India, has often been shown in books, and doubtless many of you are quite familiar with its appearance. This has found a final resting-place in the Ordnance Survey Office, Southampton.

The surveying equipment of the pioneer explorer of early days, say, of from twenty to sixty years ago, usually consisted of a sextant and artificial horizon, a chronometer or watch, prismatic compass, boiling-point thermometers, and aneroid. With the sextant and artificial horizon the astronomical observation for latitude and longitude were taken, as well as those for finding the error of the compass. The route was plotted from the compass bearings and adjusted to the astronomically determined positions. The latitudes were usually from meridian altitudes of the sun or stars, and longitudes from the local mean time derived from altitudes east or west of the meridian, compared with the times shown by the chronometer, which was supposed to give Greenwich mean time.

The sextant, in the hands of a practical observer, is capable of giving results in latitude to within 10" or 20", provided it is in adjustment, but the difficulty is that the observer has no proper means of testing for centering and graduation errors.

The great drawback to the sextant for survey work is that it is impossible to take accurate rounds of horizontal angles with it, since, unless the points are all on the same level, the angles must be too large. It is essentially a navigator's

instrument, and nowadays has been almost entirely superseded by the theodolite for land-surveying.

As regards the longitude, the difficulty was always to obtain a steady rate for the chronometer, owing principally to the unavoidable oscillations and concussions met with in transit. Formerly it was customary to observe lunar distances for getting the Greenwich mean time instead of trusting to the chronometers, but these, even with the utmost care, are very unsatisfactory.

In more recent years the occultation of a star method of finding the Greenwich mean time superseded almost entirely the lunar distance, but all of these so-called 'absolute' methods of finding longitude are fast becoming out of date since the more general introduction of triangulation and wireless telegraphy.

Heights of land were usually obtained by the boiling-point thermometer or aneroid.

This then was the usual equipment of the pioneer. With such an outfit the greater part of the first mapping of Africa and other regions of the world was carried out, with results that were more or less reliable according to the skill of the explorer and the time and opportunities at his disposal.

In recent years considerable improvement has been made in the instruments and methods of the geographical surveyor: the introduction of the Invar tape for the measuring of the baselines, the more general application of triangulation, the substitution of the theodolite for the sextant, the use of the plane-table for filling in the topographical details of the survey, the application of wireless telegraphy to the determination of longitudes, these and other improvements have all tended to greater accuracy and efficiency in geographical and topographical mapping, so that in many respects the rough approximate methods of the earlier explorers are fast being superseded by instruments and methods more in keeping with modern requirements in map-making.

Still, the principal underlying all surveying is the same, and the whole subject really amounts to the best and most accurate methods of measurement with a view to representing on a plane, on a greatly reduced scale, the leading features of a certain area of the earth's surface in their relatively correct positions; and so it resolves itself into geometrical problems of similar angles and proportional distances. This being the

case, it is clear that it becomes in the main a question of correct angular and linear measurements, and all the improvements in survey methods have had for their object the increased accuracy of accomplishing this, together with greater facility for computing the results.

What we do now is exactly what was attempted by the early Greek geometricians and others in ancient times, only we have far more accurate instruments. If, for instance, we compare our modern micrometer theodolite with the old scaph of the Greeks the contrast is striking, although both had the same object in view as regards taking altitudes of heavenly bodies. Many of the old instruments, in spite of their great size, were extremely rough, and the angles could only be read with approximation or to a great extent by estimation, while the theodolite, which is now generally used on geographical surveys, although it has circles of only five inches in diameter, can, by means of the micrometers, be read to $2''$ of arc, or even to $1''$ by careful estimation. This, when one comes to think of it, is a triumph of refinement, since it really means that we can measure to within about $1/83333$ part of an inch, which is the space occupied by $1''$ on the arc of a circle of five inches diameter. At least this is the theoretical accuracy, but in practice there are, of course, errors in sighting, setting the micrometer wires, and those arising from other sources which have to be taken into consideration.

The continued striving after great accuracy of measurement applies not only to angular measuring instruments, but to linear distance measurement as well; and the improvements in apparatus for this purpose, could we follow them in detail, would be most interesting. From the rough methods that would suggest themselves naturally to early intelligent men, and some of which I referred to in the earlier part of this address, to the modern baseline apparatus, and accurately computed sides of a geodetic triangulation, is a far cry, and the advance in this matter is certainly remarkable. What would the ancient geographers have said if they were told of the accuracy of a modern first-class triangulation, such as that of our own Ordnance Survey or of the Survey of India?

Still absolute accuracy of measurement of any kind seems to be an impossibility, and the best we can do, after all, is to approach it as near as we can, and to arrange matters so that the inevitable errors will tend to balance one another. Nature

herself seems to object to perfection in measurement. For instance, when we attempt to measure a distance, and have taken all precautions we can, changes of temperature occur and alter the length of our measuring-tape, and, in spite of all that has been done by manufacturing tapes of alloys of different metals in order to counteract this effect, uncertainty must exist to some extent. Then as regards our angular measuring instruments, not only must there always be personal error and some imperfections in the graduation and centering, but the change of temperature again comes in, affecting the metal, and attempting to defeat our object of obtaining perfection. If we desire to measure the true vertical angle, there is always the troublesome and uncertain effect of the refraction of the atmosphere, which makes the mountain-top appear in a different place from where it really is, according to the heat, moisture in the air, and all sorts of other unknown causes which, in spite of all the corrections we may apply, occasion at least some uncertainty as to our result, whilst, in the case of the sun or star, it is considerably worse. So great is this refraction that when the sun appears to be just above the horizon, as you see it over the sea, it is actually not there at all, and has gone down below the horizon. Of course tables have been constructed to correct for all this, but no one can say that they are really accurate, as the results depend so much upon local conditions, and they must after all be considered merely devices for making the best of a bad job. Then, again, when we have taken all possible care with the levelling of a theodolite, Nature, through inequalities of gravity, has an unsuspected trick of drawing the level out of its normal position, which introduces uncertainty, and is often most bewildering in its result. But enough has been said on this subject. The only safe rule for a surveyor to follow is never to assume that he is correct, and to take his observations so that they tend to compensate one another, whenever it is possible to do so.

So far what I have said has had chiefly to do with some of the earlier attempts at surveying and map-making, and the instruments and methods by which these have been carried out; and I will now try to give you an outline of what has been done in comparatively recent times, and state briefly the present position of various parts of the world as regards the condition of their mapping and the survey basis upon which their maps depend.

Little by little civilised man, by his daring, his love of adventure, and the necessities of events and circumstances, has penetrated into the unexplored parts of the earth and pushed back the clouds and mists that so long shrouded them from his knowledge, until at the present time the regions that are entirely unmapped are very few indeed, and do not amount to more than about one-seventh of the whole land-surface of the globe, including the unexplored areas of the Polar regions, which may be either land or water. Not content with a mere vague acquaintance, he has striven for greater accuracy, and has turned to various branches of science and called them to his aid, in order that he may obtain more correct knowledge and a better comprehension of the earth's features. To enable him to fix with definiteness the position of places upon its surface, map out the various land-forms, and obtain their accurate measurements, he has consulted the astronomer and mathematician. Commencing, as we have seen, with the rudest instruments and measuring apparatus, these, as greater accuracy was required, have gradually been improved, until the present-day appliances and equipment of a surveyor are a wonder of refinement and delicacy.

In order that we may obtain a general idea of what parts of the world have been mapped and what have not, as well as ascertain something of the value of the survey basis for maps of the various parts of the world at the present time, I will now show a map I have recently drawn. It is merely an outline, and diagrammatic in character; but I trust will help to make the matter plain. By way of comparison I have drawn another map showing what was surveyed at all accurately, mapped from rough surveys and entirely unsurveyed and unmapped in 1860—that is, nearly sixty years ago. These maps (Plate I.) will, I hope, make the subject clearer to you than if I placed before you mere tables of figures and statistics, which, though important in their place, do not convey to the eye at a glance the facts and proportions that can be furnished by diagrammatic maps and diagrams.

For the sake of comparison of relative areas, the maps are all drawn on an equal area projection, that is to say, a certain area on the map, such as a square inch, everywhere represents the same area on the earth's surface. The idea kept in view in drawing the maps is that the shade deepens as the accuracy of the survey increases. (1) The parts that are topographi-

cally mapped from triangulation or rigorous traverses are shown by the darkest tint; (2) those that are less accurately mapped from surveys chiefly non-topographical, and of which in many places the basis consists to a great extent of disconnected land-office and property plans, are shown by the tint next in density; and then the next lighter tint (3) represents the parts of the world that are only mapped from route-surveys or rough traverses of explorers. Although these traverses vary greatly in degree of accuracy, they cannot be considered so reliable as the surveys shown by either of the other two shades, and in many cases the mapping consists of the roughest sketches. (4) The regions that are entirely unsurveyed and unmapped are indicated by the lightest tint of all, almost white.

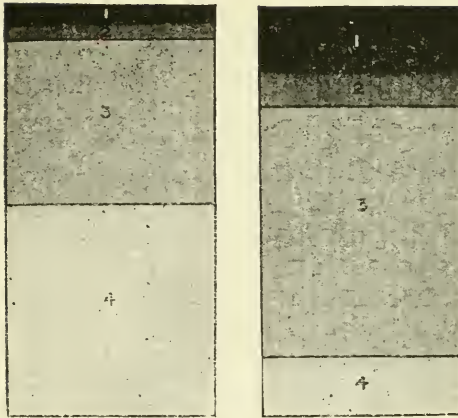
I have attempted to form an estimate of the condition of the world's surveys as represented by the differently tinted areas on the maps for 1860 and 1916; and, taking the total area of the land-surface of the earth together with the unknown parts of the Arctic and Antarctic regions which may be either land or water, to be 60,000,000 square miles, I have obtained the following results:—

	1860		1916	
	Sq. Stat. Miles	Proportion to Whole	Sq. Stat. Miles	Proportion to Whole
1. Mapped from accurate topographical surveys based on triangulation or rigorous traverses	1,957,755	= 0·0326 or roughly 1/30	8,897,238	= 0·1482 or roughly 1/7
2. Mapped from less reliable surveys, chiefly non-topographical	2,017,641	= 0·0336 or roughly 1/30	5,178,008	= 0·0866 or just over 1/12
3. Mapped from route traverses and sketches	25,024,360	= 0·4170 or roughly 2/5	37,550,552	= 0·6258 or little less than 2/3
4. Entirely unsurveyed and unmapped	30,997,054	= 0·5166 or just over 1/2	8,350,794	= 0·1391 or little less than 1/7

These proportions can perhaps be more clearly seen from the following diagram, on which numbers and tintings have the same significance as on the maps and table.

1860

1916



From the figures here given it is plain that with the same rate of progress as that of the past sixty years or so it would take just over four hundred years more to complete the accurate trigonometrical surveying and topographical mapping of the earth's land-surface, including the parts of the Polar regions that may possibly be land—that is, the 60,000,000 square miles which we have taken for this total area; but this will certainly not be the case, since the rate at which such surveys have been carried out has been greatly accelerated during recent years, owing to the rapidly increasing demands for accurate topographical maps, improvements in methods, and other causes, so that it will possibly not be half this time before all the parts of the earth's surface that are likely to be of any use to man as settlements, or capable of his development, are properly surveyed and mapped. There are, of course, regions, such as those near the Poles and in the arid deserts, that are never likely to be accurately triangulated and mapped to any extent, and it would be mere waste of time and money to attempt anything of the kind.

Many and varied have been the influences that have led to the surveying and mapping that have already been accomplished, and it would be interesting if we had time to analyse them. Among the preliminary surveys, I think it would be found that military operations would hold an important place. Many an unexplored region has been mapped for the first time as the result of frontier expeditions, such as those of

the frontier regions of India and parts of Central and South Africa, while the need of a more exact acquaintance with the topographical features for military requirements have frequently led to more exact trigonometrical surveys. Our own Ordnance Survey is indeed an example of this, for in the first place it resulted from the military operations in Scotland in the latter part of the eighteenth century.

Among other causes that have resulted in surveying and mapping might be mentioned the delimitation of boundaries, commercial or industrial undertakings, such as gold-mining and land development, projects for new railways, all of which have at times been fruitful in good cartographical results. Nor must we forget Christian missions. The better-trained missionary has always recognised the importance of some sort of a survey of the remote field of his operations, and the route to it, if for no other reason, with a view to the good of his fellow-workers and those who come after him; and in the earlier days specially perhaps most of all pioneer mapping was done by the self-sacrificing service of the missionary. We have only to think of such men as Moffat, Livingstone, Arnot, Grenfell, and others of the same sort, to be reminded of the debt due to the missionary from all interested in geographical mapping.

Still, few of the expeditions referred to so far have had surveying as their primary object, and such mapping as has been carried out has been incidental and necessary for the prosecuting of the main purpose in view. Properly equipped surveying expeditions that have been despatched from this and other countries have during recent times added enormously to our knowledge of the surface configuration of the earth.

The surveys of British possessions in Africa and other parts of the world under the Colonial Office have recently made rapid progress, and full particulars of the work done are given from year to year in the Annual Report of the Colonial Survey Committee, which was first published in 1905. These reports, accompanied by plans and diagrams, contain most valuable information, and show exactly what has been done, the method employed, cost of surveys, &c. All who are interested in these matters would be well repaid by a careful perusal of these valuable publications, which only cost a few shillings.

From its very foundation the Royal Geographical Society

has had a remarkable influence on the surveying and mapping of the earth's surface, and especially those parts of it which have been previously but very imperfectly known or entirely unexplored. I think it must be admitted that this influence has increased as years have gone by, and it is no exaggeration to say that it has done more in this respect than any other body. It is therefore perhaps fitting that I should give some account of what has been accomplished, as it has a direct bearing on route-surveying and mapping by travellers and explorers. It is not only by the awarding of annual medals to explorers whose journeys have resulted in an increase to our geographical knowledge, and the more accurate surveying and mapping of little-known parts, that the Society has stimulated and encouraged geographical research, but it has also assisted financially numerous expeditions, and the money thus granted has enabled many a man to carry out his explorations to a successful issue, which he otherwise could not have done for the want of funds. Still more frequently has it been the case that travellers going into little-known parts of the world have been granted loans of surveying instruments which they could not otherwise have taken, and encouraged to do what mapping they found possible. Altogether 331 expeditions have been lent instruments, and about £38,500 have been devoted to grants of money by the Society to further geographical exploration and surveying.

There is still another way, by no means the least important, in which the Royal Geographical Society has done much to promote geographical surveying, and that is by providing suitable instruction in the work of surveying for travellers. It is all very well to grant money and lend instruments, but the important thing is to know how to make good use of the money and the instruments so as to take proper advantage of opportunities afforded and to do the best surveys and maps of the regions visited. In the early days of the Society a man had to pick up the requisite knowledge as best he could, but in 1879 a scheme of proper instruction was started at the suggestion of the late Sir Clements Markham, who was then one of our Honorary Secretaries. This had small beginnings, but in recent years has made rapid strides, until at present it forms one of the most important parts of the Society's work. This course of instruction in geographical surveying, which has now been in existence for about thirty-eight years, was first conducted by my predecessor, the late

Mr. John Coles, and, since he resigned in 1900, has been under my charge. Altogether 725 surveyors and explorers have received instruction, without reckoning special large classes of forty or fifty men which during the past few years, until the outbreak of war, have been sent to us by the Colonial Office to learn the more elementary parts of compass-traversing and mapping.

Now as regards the future. The demand for properly trained geographical surveyors has been steadily increasing in past years, and is likely to be still greater as time goes on. After the termination of the war there will be much work to be done, especially as regards the surveying of new boundaries, and freshly acquired districts in Africa and elsewhere; and it would be wise to make preparations for this well ahead.

The future surveyor will be in a much better position than his predecessors, not only on account of the improvements in instruments and apparatus for his work, but because, in many parts, a good beginning has been made with the triangulation to which the new surveys can be adjusted. In Asia a considerable amount of new work of this kind has been done over the frontier of India in recent years by the Survey of India, among the more important of which is the connecting of the Indian triangulation with that of Russia by way of the Pamirs. The many boundary surveys that have been carried out in Africa, the triangulations of Egypt, the Soudan, East and South Africa, and other parts of the continent are well advanced, and will be of the utmost value to the future surveyor. One of the most important lines is the great triangulation which, it is hoped, will some day run across the continent from south to north, from the Cape to Egypt. Owing to the energy of the late Sir David Gill, this important chain of triangles has already got as far as the southern end of Lake Tanganyika; the part to the west of Uganda near Ruwenzori has also been finished, and it now remains to carry the chain through German East Africa and down the Nile Valley. The latter, it is hoped, will by degrees be accomplished by the Soudan and Egyptian Survey Departments, although it may be delayed for some years yet; and the former, which was to have been undertaken by the Germans, it is to be hoped will after the war be accomplished by British surveyors, through—not German East Africa—but newly acquired British territory. Running right through parts of Africa that are but imperfectly mapped in many districts, the stations of this triangula-

tion will be invaluable for the adjustment of any network of triangulation for future surveys in the interior, and, indeed, have already been utilised for the purpose.

The carefully carried out boundary surveys between various countries of South America will be of the greatest assistance in future exploration and survey in the interior of that continent, wherever they are available, while the Survey Departments of Canada and the United States are doing excellent work and extending their surveys far into the imperfectly-mapped regions of North America. So, altogether, the surveyor of the future will soon have a good foundation of reliable points to work from. It is important to remember that running a chain of triangles across a country, though important as a framework, does not constitute a map of the country; and what is wanted, at any rate in the first place, is a series of good topographical maps, based upon triangulation, showing the leading features with sufficient accuracy for the purposes of ordinary mapping, so that on scales of 1 : 250,000, or even 1 : 125,000, there is no appreciable error.

As regards instruments, the *Astrolabe à Prisme* is being increasingly used for taking equal altitude observations with most excellent results, but at the present time the five-inch transit micrometer theodolite, already referred to, is perhaps all that is required for general work. It has now been thoroughly tested and found most satisfactory. As regards smaller instruments there is the four-inch tangent-micrometer theodolite, and for rapid exploratory survey, where weight is a great consideration, a little three-inch theodolite has been found useful.

For baseline measurement the invar tape should be taken on all serious work, and for filling in the topographical features a good plane-table is doubtless the instrument to use. In mountainous regions and in some other special conditions photographic surveying doubtless has a future before it, and in military operations when the photographs are taken from aircraft it has proved itself invaluable; but in ordinary surveying it is, I think, not likely to take the place of well-established methods. The introduction of wireless telegraphy for the determination of longitude is likely to increase in usefulness. Good examples of the work done with it have lately been given in the 'Geographical Journal' and elsewhere.

Time does not permit of my going more fully into this subject, and I must now bring this address to a close.

MEETING OF THE BRITISH ASSOCIATION FOR THE
ADVANCEMENT OF SCIENCE,
NEWCASTLE-ON-TYNE,
SEPTEMBER 5TH—9TH, 1916.

(Report of the Delegate, HARRY SOWERBUTTS, A.R.C.Sc.,
taken as read at a Meeting of the Society held on Tuesday,
October 17th, 1916.)

THE arrangements for this meeting, which was the second held in the British Isles during the war, were similar to those for the previous meeting, held at Manchester, and a similar feeling of satisfaction was expressed at the scientific value of the meeting.

The only way in which the scientific results may have suffered is that caused by the reduction of the amount available for grants for the Research and Investigation Committees due to the smaller membership.

The Conference of Delegates of the Corresponding Societies met, as usual, on two occasions, both of which meetings were attended by your Delegate.

At the first meeting, the Secretary of the Conference intimated that the matter raised by Prof. Sir T. H. Holland, K.C.I.E., F.R.S., at Manchester (as mentioned in last year's report), had been considered by the Committee, who had decided that no action was possible during the war, and he also intimated that the question of "Colour Standards" had been referred to Section A.

The President of the Conference, Prof. G. A. Lebour, M.A., B.Sc., F.G.S., gave an address on "Co-operation," chiefly in relation to Natural History Societies and Field Clubs.

Mr. P. J. Ashton, of the Selborne Society, read a paper on "The Encouragement of Public Interest in Science by means of Popular Lectures," and a Report of a Committee appointed by the Council of the Association to consider and report on the Popularisation of Science through Public Lectures, was submitted. After a full discussion, it was resolved that the Council be thanked for the opportunity given to the Conference to consider the Report, and that the recommendation for the re-appointment of the Committee to further consider the matter be approved and supported.

At the second meeting Mr. Arthur Bennett, of the Warrington Society, read a paper on "The Desirability of forming Federations of Societies with Cognate Aims." This was a fine literary address in which Federation was strongly advocated for application to all the activities of man. During the discussion your Delegate mentioned the formation, four years ago, of the Associated Educational Societies Committee in Manchester, and gave particulars of the results so far attained.

The final paper was a short account of the late Mr. Pengelly's work of discovery and exploration in Kent's Cavern, prepared by his daughter, Mrs. Hester Forbes Julian, whose health did not permit her to attend personally, so her paper was read by Mr. W. Whittaker, F.G.S.

In the paper, which was very interesting, she specially mentioned the care with which each specimen found by Mr. Pengelly was marked with the position (including depth) which it had occupied, and the want of any such care at the present time, and concluded by raising the question of "The Importance of Kent's Cavern as a National Site." It was resolved, unanimously, that the Council of the Association be requested to take the requisite steps to have Kent's Cavern placed under Government or other suitable control.

The papers read in Section E (Geography) were, as usual, mainly of a scientific character. The address by the President of the Section, Mr. Edward A. Reeves, F.R.A.S., F.R.G.S., was on "The Mapping of the Earth: Past, Present and Future." (See p. 81.) The maps and diagrams with which it was illustrated were the same as those shown by Dr. J. Scott Keltie, F.R.G.S., in his address to the Society on April 4th, 1916, and for which Dr. Keltie was indebted to Mr. Reeves.

There were three addresses of a popular character, illustrated with lantern views. Dr. W. S. Bruce, F.R.G.S., in an account of the Scottish Antarctic Expedition, gave a full description of the Weddell Sea, which was of special interest on account of the return of Sir Ernest Shackleton.

The finest lantern slides were shown when the Rev. Walter Weston, M.A., F.R.G.S., read a paper on "Recent Exploration in the Japanese Alps." It is not necessary to report further on this paper as the Rev. Walter Weston's lecture to our Society is given in full in the Journal (Vol. XXXI).

The third afternoon lecture was by Mr. H. C. Woods, F.R.G.S., on "Salonika: its Geographical Relation to the Interior." As I was on this occasion at the Conference of Delegates I give the following full report from the "Newcastle Daily Chronicle":—

"In the earlier part of his paper, Mr. Woods gave an interesting description of the port and town of Salonika. Possessed of a small modern harbour, in one sense the place was completely materialistic and vulgar, whilst in another it had the appearance of being a sort of relic of the past. This was due in part to the unique composition of its population. Out of a total of about 125,000, approximately 75,000 were Jews. There were about 15,000 Dounmes, a sect whose exact beliefs were not properly known, and from among whom some of the ablest members of the Committee of Union and Progress were recruited by the Young Turks. The Jews, many of whom were of Spanish descent, controlled the business of the city and surpassed the Greeks in their commercial ability. Partly owing to its enclosed position, the heat in June, July, August and early September was intense, particularly at night. Mosquitoes were so numerous that in many parts of the town it was advisable to sleep under nets almost throughout the year. Between the 10th and 15th of September the atmosphere was cooled by the heavy rains which invariably fell at that period of the year. In the town there was seldom a heavy fall of snow, but in the hills it was prevalent in winter, when the roads were often stopped by it, and when the rivers were swollen by the winter rains or the melting snows it was difficult or impossible to ford them.

"Macedonia could not be considered as a concrete whole, being, politically and geographically, divided into watertight compartments. It was a locality possessed of certain well-defined routes, which constituted natural lines of communication. The Vardar Valley, dividing East from West, and, with the Morava Valley, constituting the great high road from South to North, made Salonika the natural port of a large area of the Western Balkans. The importance of the valley and the port were interdependent, and either Salonika and its surroundings ought to belong to the owner of the valley or the valley ought to be annexed by the owner of the port. Near Salonika, while the country west of the Vardar was low and marshy, on the east it was hilly if not mountainous. The

line of mountains and lakes which ran across the Chalkis Peninsula constituted a naturally strong defensive position.

"The various roads and lines by which it was possible to advance from Salonika were fully described. There were three more or less distinct routes; those which ran in the direction of Monastir, those by or leading from the Vardar Valley, and those which connected Eastern Macedonia with Bulgaria, the positions of which latter were governed by the all important Rhodope Balkans. Unless they had been doubled by the Allies, all the railways were single, most of the roads were out of repair, and many of the bridges were in bad condition. Partly owing to the lack of adequate communications, the difficulty of conducting a campaign in Macedonia was considerable. The Vardar Valley was so narrow that a great part of it was traversed only by the railway and not by a road. The ordinary means of transport had for the most part to be replaced by pack horses, and big guns by mountain artillery, which could traverse roads not passable by wheeled traffic. Again, the drought of summer, which, except in the actual valleys, always made water a difficulty, placed upon the supply sections of the Army a burden destined considerably to increase the magnitude of their task.

"The whole military position at Salonika had been changed by the entry of Rumania into the war, and the enormous difficulty of making an Allied advance must have been considerably lessened, and what had been impossible in the past might conceivably be feasible in the future."

The paper was illustrated with a series of views of places of interest and maps of the country. For the excellence of the lantern views and for his paper Mr. Woods was cordially thanked.

The most largely attended morning meeting and the one of greatest interest was on Thursday, September 7th, when there was a discussion on "Political Frontiers," followed by the question of the claims by Italy to the country on the east of the Adriatic.

The discussion on "Political Frontiers" was introduced by Sir T. H. Holdich, who said that it must be admitted, though reluctantly, that the best way to preserve peace among the nations was to part them by as strong and as definite a physical fence as could be found. A boundary must be a

barrier, and the position of it must be influenced largely by the will of the people. The annexation of territory against the will of the people had always been regarded as a political blunder. The assimilation of its people with the conquering nation was a slow and often an impossible process. An admixture might be effected mechanically, but real chemical fusion never took place. Under such circumstances it was seldom that the acquired territory was a safe and thoroughly sound unit in the political entity. As to the methods of ascertaining the will of the people a plebiscite had been suggested, but he could not imagine a surer way of starting an armed conflict. Where opinions were divided and the expression of them weak and wobbly, sentiment might well be allowed to give way to physical conditions which should govern the line of partition. It was quite probable that we should before long be faced with a comparatively new phase of boundary problems where there could no longer be the excuse of want of sound map knowledge of the districts concerned to account for misleading and inaccurate delimitations, but where ethnical interests of the most important character would possibly present painfully complicated problems. In no case, however, could he imagine that the wishes of the majority of the people concerned would be difficult to ascertain.

He insisted that the boundary must be a sound and unbroken barrier as far as possible, and that it must be selected with the great object in view of hindering in every possible way any proposed scheme of violation. Peace could only be based in this imperfect world on security. He trusted that our political representatives, impressed at last with the lessons of the war, would set about designing new political boundaries with lines as strong as they could be made. How were we to secure these strong barriers? Incomparably the best boundaries were mountain ranges. Failing a definite uplifted watershed, the ordinary divide between the heads of minor affluents of a river basin were quite a useful alternative.

Continuing, Sir Thomas said that rivers also played an important part, though it depended on conditions of environment whether a river made a good boundary or not.

Lakes and deserts were preferable to rivers, but meridians and parallels were the worst possible boundaries, as is evidenced by the chief example of this kind, that between

Canada and the United States, which after over 100 years is not definitely determined in some portions even yet.

In conclusion, he said he did not imagine that in the reconstruction of political frontiers at the close of the war there would be any great departure from the old order which adopted elevations and placed strong fortresses at intervals to guard frontiers. It was the strength of the line of French forts from Belfort to Verdun which determined the initial strategy of the German campaigns, and it was the Rhineland fortresses, and not the Rhine itself, which would protect the western frontiers of Germany.

Professor Lyde, of University College, London, regarded a river boundary as preferable to a mountain one, and thought the best boundary was one which permitted the maximum of peaceful association with a minimum of warlike intercourse. Where there was a navigable river in an area through which a political frontier was drawn the frontier should follow the fairway of the river. He also urged that navigable river frontiers should be made international.

Professor J. W. Gregory, D.Sc., F.R.S., F.R.G.S., Miss Marion I. Newbigin, D.Sc., Mr. H. C. Woods, F.R.G.S., and Mr. Edwin Ransom, F.R.G.S., continued the discussion, and the unanimous opinion expressed was in support of the views of Sir T. H. Holdich.

Dr. Marion I. Newbigin then read a paper on "Italy and the Adriatic." She said that so much had been heard of the Slav point of view of the Balkan settlement that she considered it advisable for the Italian point of view to be stated, and so, mainly by means of extracts from the utterances of Italian statesmen, authors, and other public men, she indicated the hopes of the Italian public with regard to the eastern shore of the Adriatic. Finally, she said that it seemed unlikely that Italy after displacing Austria from the north-eastern shore of the Adriatic, would permit a new and energetic nation to take the place of Austria.

The President of the Association, Sir A. J. Evans, F.R.S., who came in just before the conclusion of Dr. Newbigin's paper, began a discussion, in which Mr. G. G. Chisholm, M.A., F.R.G.S., and Mr. H. C. Woods, F.R.G.S., joined, by giving from the reasonable Slav point of view what he considered was possible, and that was that Italy should have Trieste and Pola, on condition that Trieste should be a free port, also the

keypoint of Valona and certain islands. If she tried to obtain more it would be at the risk of almost certain war in the near future.

A joint meeting of Section C (Geology) and Section E was held on Friday morning, when Dr. A. Wilmore, F.G.S., read a paper on "The Physical Geography and Geology of the Northern Pennines." There was a large attendance, and an interesting discussion took place, mainly from the geological point of view. Dr. Wilmore has kindly arranged to give this paper, with certain modifications, to the members of this Society.

It seems to me most advisable to deal with the remaining six papers in the order in which they were delivered.

Prof. H. J. Fleure, D.Sc., F.R.G.S., read a paper on "France: a Regional Interpretation," and I am greatly indebted to him for the following résumé of his paper:—He dealt with some of the chief aspects of the evolution of French life and its forms of expression, relating them especially to the sunny climate of olive and mulberry in the south-east and to the hard labour of the corn lands tempered by the wealth of the vine in Upper Burgundy, Aquitaine and the Paris basin. In Provence there has been leisure for many centuries to devote to thought and to art, and Provence has again and again led France in idealism. Its Græco-Roman tradition is very vital, and the Roman portion of it has permeated the whole south in which the civic institutions are the effective town centre, and the cathedral (around which the town of the Paris basin has been built) may be almost an interloper. The central cathedral in the Paris basin is the sign that the church is the bearer of the Roman tradition there. It is also a sign that the gradation from the south to the Paris basin is easy enough to allow inspirations to spread northward to that basin before they have become dulled. The Gothic architecture is most characteristic of the Paris basin, and has spread thence along the main roads from that basin even back into the classic south. It has been characteristic of the Paris basin to lay stress on the need for unity, and for the classic south, with its tradition of civic debate, to criticise that attempt at unity time after time. Thus the Albigenian and Huguenot areas were both in the south and even almost coincident, Provence, with its æsthetic literary interest, holding aloof in both cases.

North and south were again contrasted in their mediæval universities. In the south the students employed teachers; in Paris and the north the masters gathered students, but Toulouse University, founded to cope with the Albigensian heresy, is of the Paris type. Burgundy and Aquitaine are both intermediate in character, and Aquitaine also reveals traces of its Bronze Age civilisation, which are stronger still in Brittany, whence they have spread to contribute much to the life of France.

The Paris basin illustrates in specially intense fashion the fusion of Mediterranean, Celtic, Northern and Central European elements of culture with a unified civilisation.

The paper was illustrated with many maps and pictures of the various buildings and scenes mentioned, and others of a like character. The views of the cathedral at Chartres being specially pointed out, the church being most typical and built largely by pilgrims from a wide area.

In reply to a question, Professor Fleure dealt with the great trade routes across France, indicating that it had been from the earliest times the opportunity of France to serve as a means of communication, and it was this which to some extent helped to bind together the various, so diverse, provinces of France.

The paper by Mr. G. G. Chisholm, M.A., F.R.G.S., on "Generalisations in Geography, and more especially in Human Geography," was a well thought out paper, and of great value to students and teachers.

On Friday morning Captain Rodwell Jones read a paper on "The Evolution of the Port of Hull." He first mentioned a volume with a similar title, Mr. T. Sheppard's "Evolution of Hull," but said that this was simply a catalogue of all the maps of Hull which were known to have been issued, illustrated with reproductions of many of them. This was a very valuable list, and he had had some of the reproductions made into lantern slides to illustrate his paper; he considered this production to be an example well worthy of being copied by other curators of municipal museums. Captain Jones traced the growth of the Port, mainly due to its forming the outlet for the large Ouse and Trent plain. The paper was full of interest, and well illustrated with slides of maps and views. This paper was practically the only one read at the meeting dealing with local geography.

Mr. George Philip, F.R.G.S., gave a paper on "Economic Maps," being really a description of suggestions for a new series of economic maps for school atlases. He had made several experiments and devoted much time to the question, trying to decide which was the best method to adopt, and said that he would appreciate any criticisms by the teachers present of the samples of maps which he had had made and submitted to the meeting.

The Rev. W. J. Barton, M.A., F.R.G.S., expressed approval of the methods suggested, and explained the reference to economic maps in the Report of the Committee on School Atlases, submitted to the Meeting held last year at Manchester.

Dr. E. C. Jee read two papers on the Annual Variation of Temperature and Salinity of the Waters in the English Channel and on the Periodicity of Sea Surface Temperature in the Atlantic Ocean. He showed that there seemed to be some connection between the quantity of fish landed at the south and western ports of Britain with the temperature and salinity of the water, and some very interesting curves had been obtained from the observations taken.

The last paper read at the Section was by Mr. B. C. Wallis, B.Sc., F.R.G.S., on "Some Geographical Aspects of a War Indemnity." As your Delegate was attending the Conference of Delegates at the time when this paper was read he was not able to be present, and submits herewith a report from the "Newcastle Chronicle":—

"Assuming that the issue of the war was such that the indemnity would be paid by the enemy, and that it would be paid, partly at least, not in cash but in kind, his general principle might be summarised in the statement that the enemy should not be so placed that he would reap the material advantage for commercial purposes. Whatever might be the reason that the advance on Paris was stopped, the fact remained that that battle line gave the enemy Luxembourg, North-eastern France and Belgium, with their collieries, factories and forges. He advocated that for every ship destroyed by the enemy an equal number should be supplied ready for use, and in the cases where factories had been destroyed, and train loads of machinery transported into German factories the indemnity should include the restoration of those factories and machinery in going order."

A brief discussion followed.

The only other matter dealt with by Section E was at a joint meeting with Section A (Mathematical and Physical Science) on the Thursday afternoon, when a report by a Committee, consisting of Sir F. W. Dyson, Colonel C. F. Close and Colonel E. H. Hills, on "The Future of British Geodesy, with special reference to the United Kingdom and the Crown Colonies and Protectorates," was submitted and considered. After some discussion a resolution was passed asking the Council of the Association to appoint a larger Committee (a list of names for which, including the three mentioned, was drawn up) to fully consider the matter.

Section H (Anthropology) held a meeting on the Saturday morning, when a paper of great geographical interest was read by Mrs. W. S. Routledge, M.A., on "Some of the Mysteries of Easter Island," on which island she and her husband had stayed for some years in order to investigate its mysteries, especially the curious graven images found there. The paper was well illustrated with many lantern photographs.

In this Section there had been other papers of special geographical interest, such as: "The Gurkha and His Mountain Home," by Mr. A. Trevor Battye; and "A Summer and Winter among the Tribes of Arctic Siberia," by Miss Czaplicka.

The evening discourses for the members of the Association were delivered in the Town Hall. The address on "Archæology," by the President, Sir Arthur J. Evans, D.Litt., F.R.S., contains much of value, and will be read with appreciation.

All present were apparently deeply interested in the lectures on the Thursday and Friday evenings. The first was by Prof. W. A. Bone, F.R.S., on "Flame and Flameless Combustion," the latter part of the lecture dealing with flameless combustion, being an account of a discovery, the development of which promises to revolutionise the boiler industry. He illustrated the lecture with many experiments, all of which were very successful; the success of each being acknowledged by those present.

Dr. P. Chalmers Mitchell, F.R.S., gave the other lecture on "Evolution and the War," and during the lecture received much applause, which was well merited. I give herewith a

short report of his lecture from the "Newcastle Daily Chronicle :—

" He showed that before Charles Darwin's publication in 1859 on the ' Origin of Species,' evolution had remained a toy of philosophy. The scientific view was that the evolution theory was proved beyond all possible reversion, but that the theory of natural selection remained an hypothesis, which at best was very much in debate. But the popular view was different. The popular view had confounded the two elements of Darwinism. That confusion had led to the conclusion that men rose to higher things not on the stepping stones of their dead selves, but over the dead bodies of all that came in their way. From the theory of the survival of the fittest had been evolved a goddess the cruellest ever imagined. This misrepresentation of Darwinism had deeply absorbed the attention and inspired the conduct of the German nation.

" Having quoted Bernardi and other German and kindred writers, Dr. Mitchell sought to show that this German theory of war was not Darwinism. In the case of the black and grey rats there was not a single particle of evidence of the one species spreading at the expense of the other, or of one species fighting the other. Even if we believed as the Germans certainly did that the Germans were the greatest and most civilised and the foremost of all the races of the world, and that it was their duty to spread their ' kultur ' to the uttermost parts of the earth—even if we believed this ; it would be seen that, while in peace times the German theories were infiltrating everywhere, the Germans would wake from their present evil dream to find that the war had closed every door to even the highest achievements of German science, German art and German literature.

" To maintain against military domination the peaceful progress of the world there was no sacrifice of human life, no interruption to scientific progress, that was too great. When the victory came we should owe peace not to the pacifists who had stayed at home, but to the soldiers who had fought and died."

There was only one official social gathering, and this was an informal reception by the Lord Mayor in the Laing Art Gallery, where a loan collection had been specially arranged for the Association Meeting, illustrating the rise and progress of engraving and etching. There was a good attendance,

especially in view of the intense darkness of the streets, and it was a successful function.

I feel that I must not conclude my report without referring to the Black Gate and the Castle (or keep), both part of the old Castle. These are of intense interest, and at present are (and it is to be hoped long will be) kept in a very good state of preservation, principally by the care of the Society of Antiquaries; and, further, to the large number of fine parks and open spaces, the gem of all being the famous Jesmond Dene, which is glorious and beyond description.

At the final meeting of the Association, after the thanks of the meeting had been accorded to Dr. Chalmers Mitchell, the thanks of the Association were tendered by the President to Principal W. H. Hadow, M.A., D.Mus. for the University of Durham, to the Rt. Hon. the Lord Mayor and the Corporation, to various local institutions, and to the local Officers and Committee for their valuable services in preparing so ably for the Meeting, and making the requisite and suitable arrangements, resulting in the Meeting having been of a very successful and interesting character.

Annual Meeting, 1916.

THE 31ST Annual Meeting of the Society was held, by kind permission, in the Town Hall, Manchester, on Friday, May 12th, 1916, at 3-0 p.m.

The Right Hon. the Lord Mayor (Alderman Thomas Smethurst) presided.

The following members and friends attended :—Mr. Harry Nuttall, M.P., F.R.G.S., the Right Rev. Bishop Welldon, D.D., Messrs. E. W. Mellor, J.P., F.R.G.S., and Joel Wainwright, J.P.; Miss L. Edna Walter, H.M.I., B.Sc., Miss Armstrong, Mrs. Charnock, Miss Eccles, Miss Holt, Miss Law, Mrs. Potts, Mrs. Stordy, Miss M. E. Tinker, Mrs. M. M. White, Mrs. Wilkinson, Miss Wilkinson, Messrs. Edwin Barlow, A. Chapman (Eccles Prov. Ind. Co-op. Society, Ltd.), W. J. Dean (Eccles), George Ginger, J. W. Goodwin, J. Howard Hall, Rev. W. H. Leak, W. A. M'Grath, G. W. Nichols, T. W. F. Parkinson, M.Sc., F.G.S., Ewin Pickstone, J. Stephenson Reid, James Robertshaw, Harry Sowerbutts, A.R.C.Sc., T. W. Sowerbutts, F.S.A.A., and others.

Apologies were received from Miss S. A. Burstall, M.A., Messrs. F. Zimmern, F.R.G.S., J. Howard Reed, F.R.G.S. (owing to a dangerous illness), George Thomas, J.P., D. A. Little, F. S. Oppenheim, M.A., and S. W. Williams, C.A.

The Minutes of the Thirtieth Annual Meeting, held on May 7th, 1915, were taken as read, a full Report having appeared in the *Journal*, Volume XXXI., page 75.

The following Annual Report and Balance-Sheet were submitted by the Secretary :—

REPORT OF THE COUNCIL.

FOR THE YEAR ENDING DECEMBER 31ST, 1915.

THE Council have pleasure in reporting that, notwithstanding the national crisis, the work of the Society has been carried on successfully during the year.

The weekly meetings held during the winter months have been well attended, and the Council desire to express their thanks to all those who have given valuable help.

The interesting and instructive character of the lectures delivered will be seen from the following list :—

- "The Channel Islands." Mr. Wm. Eller.
- "Life and Character in County Galway." Rev. A. W. Fox, M.A.
- "The North of Ireland." Mr. J. D. Berwick.
- "Across Europe by Water." Mr. S. Wells, F.R.G.S.
- "The Fascination of Holland." Miss L. Edna Walter, H.M.I., B.Sc.
- "Belgium : Before the War, and Since." Rev. J. H. Burkitt.
- "With the British Army in Flanders." Mr. C. Pilkington.
- "A Chat about Russia." Councillor C. W. Godbert.
- "A 400 Mile Walk in Dolomites - Tyrol." Mr. James Shaw, F.R.P.S.
- "Three Picturesque Cities of Italy." Mr. James Shaw, F.R.P.S.
- "The Italian and French Rivas." Mr. W. H. Ward.
- "Persia : Past and Present." Mr. W. L. Flinn.
- "Southern India—Some Dravidian Landmarks." Mr. E. W. Mellor, J.P., F.R.G.S.
- "Something about Ceylon." Mr. A. Sedgwick-Barnard, M.I.E.E.
- "Ancient Arts of China." Mr. J. Hilditch, M.R.A.S.
- "Recent Exploration in the Japanese Alps." Rev. Walter Weston, M.A., F.R.G.S.
- "Progress in South Africa under the Union." Mr. T. A. Edwards, F.R.G.S.
- "Bothaland." Rev. W. A. Elliott, F.R.G.S.
- "Eastern Canada and the State of New York." Mr. Gilbert Waterhouse, M.A., F.R.G.S.
- "The Panama Canal." Mr. Wm. Eller.
- "Wanderings in Venezuela" Mr. F. G. Percival, B.Sc., F.G.S.
- "Journeys in the Mediterranean." Mr. George Ginger.
- "Round the World in War Time." Mr. H. Yule Oldham, M.A., F.R.G.S.
- "The Effect of Geographical Features on the War at Sea." Mr. T. Whyman.
- "Life in the Navy." Mr. T. Whyman.
- "The Sea and the Shore : a Study in Coast Erosion." Mr. J. A. Osborn.

These addresses were delivered in the Geographical Hall, with the exception of seven given in the Houldsworth Hall.

The lectures in the Houldsworth Hall were well attended, and the large audiences fully appreciated the able addresses

delivered, and the fine lantern illustrations (including many photographs in colour) which were shown.

The Council thank the Vice-Chairman, Mr. E. W. Mellor, J.P., F.R.G.S., for the use of his powerful lantern for the lectures in the Houldsworth Hall, and for providing the Houldsworth Hall for six of the lectures. His valuable help is highly appreciated.

The Journal for 1914 has been issued during the year in half-yearly parts.

Valuable additions to the Library and Map Collection have been made during the year, full particulars of which are given in the Journal.

The following presentations are worthy of special mention : 37 well-bound volumes of " *Le Tour du Monde*," 1860—1897, presented by the three sons of the late Mr. A. J. S. Bles, J.P., member from 1888 to his death in 1909; and a large collection of Atlases, Maps, and Charts presented by Mr. W. Richardson Kettle, F.R.G.S.

The services so freely given by the Victorians in lecturing are greatly esteemed.

The Council greatly deplore the loss by death of the following members :—

Mr. N. Bradley, J.P.,
 Mr. James Chorlton,
 Alderman Sir J. Duckworth, J.P., F.R.G.S.,
 Mr. Joseph Hallworth,
 Professor A. J. Herbertson, Ph.D., F.R.G.S.,
 Mr. Charles Illingworth,
 Mr. Wm. Jones, J.P.,
 Miss Leech,
 Mr. T. C. Middleton, J.P., F.C.A.,
 Mr. J. W. O'Leary,
 Mr. Ralph Peters,
 Mr. W. H. Robinson,
 Miss Wilde,
 Mr. S. Barton Worthington.

The Council deeply sympathise with those members who have suffered bereavement by the death of their sons in the war.

The following Members of the Society are now serving in His Majesty's Forces :—

Colonel E. W. Greg, J.P., C.C., F.R.G.S.

Colonel S. L. Mandleberg, J.P.

Major A. England, R.A.

Major P. K. Glazebrook, M.P.

Major E. Johnson, J.P.

Major E. Keith Roach.

Captain Norman Zimmern.

Lieut. C. V. Groves, R.N.

Lieut. W. Morton Johnson, F.R.G.S.

Lieut. L. E. Mather, F.R.G.S.

Lieut. G. R. Swaine.

Sub-Lieut. H. C. Handcock, R.N.R.

Staff-Sergeant H. Shorrocks.

Dr. Edgar Grey.

The Council will be pleased to receive intimation of any omissions from this list.

The Balance Sheet for the year with the Report of the Honorary Auditor is appended.

It will be seen that there is a small deficiency on the Revenue Account for the year.

The number of members on December 31, 1915, was 686, being a net decrease of 35 during the year.

Additions to the membership are urgently needed to take the place of members who have had to withdraw owing to the war, so as to enable the work of the Society to be carried on as efficiently as possible.

YEAR ENDING DECEMBER 31st, 1915.

Dr.		Cr.
1914.		
£ s. d.	£ s. d.	£ s. d.
98 6 8	To Expenses of Meetings, less Receipts for Special Lectures	Nil
78 7 5	" Journal, less sales and advertisements...	By Members' Subscriptions :— Life (Transferred to Reserve Account) Nil
46 3 1	" Rent, Lighting and Insurance	Ordinary 481 19 0
110 10 0	" Salaries	Associate 50 18 6
29 19 0	" Wages and Sundry Expenses	Societies 10 10 0
8 16 0	" Commission and Expenses, New Mem- bers, and Collection of Subscriptions	Dividend on Shares in Bldg. Co. 543 7 6
6 7 0	" Books, Maps, Binding, &c., Library ...	" Bank Interest 30 4 0
2 19 6	" Repairs to Furniture	" Deficiency, carried to Balance Sheet ... 1 9 9
		3 3 6
		£578 4 9

BALANCE SHEET, DECEMBER 31ST, 1915.

LIABILITIES.		ASSETS.	
	£ s. d.		£ s. d.
To Sundry Creditors	121 15 10	By 151 Shares of £10 each fully paid in the	
„ Subscriptions Paid in Advance	47 15 6	M.G.S. Bldg. Co. Ltd. as under:—	
„ Life Membership Reserve Account	189 0 0	56 Shares purchased	191 5 0
„ Investment Reserve Account	386 5 0	95 Shares presented	950 0 0
„ Kirkpatrick Endowment Fund	50 0 0		1,141 5 0
„ Balance as at December 31, 1914	392 7 8	„ Subscriptions in Arrear	13 2 6
Less Deficiency for 1915	3 3 6	„ Cash in Bank	23 14 10
	389 4 2	„ Cash in Hand	3 11 7
		„ Income Tax Recoverable	27 6 5
			2 6 7
			£1,184 0 6

NOTE.—The Furniture, Fittings, Books, Maps, Lanterns, Slides, Stock of Journals, etc., which are insured for £1,000, are not included as Assets in the above Statement. There are 49 Life Members (of whom one is Honorary), and the subscriptions of 30 of this number have been taken as revenue in years prior to 1908.

I have audited the above Balance Sheet and certify the same to be correct. I have inspected the Certificates for the Shares in the Building Company.

March 8th 1916.

THEODORE GREGORY, F.C.A.,

Honorary Auditor.

The Lord Mayor, referring to the fact that the deficiency on the past year was only about £3, said that he thought a great many societies in Manchester would like to be in as favourable a position. He was glad to find that, notwithstanding the war, the work of the Society had been so successfully carried on during last year. The subjects of the lectures given were not only delightfully interesting but also instructive. He did not wonder that the Society had between 600 and 700 members. His surprise was that there were not twice as many. Continuing, his Lordship urged members still to encourage lectures which applied Geography to Commerce. Personally, he had no desire to repudiate the suggestion that we were a nation of shopkeepers, for while that was a good thing for us it was not a bad thing for the rest of the world. The Society had done much to teach us something about foreign countries, to bring them nearer to us, and it, at least, recognised the truth of the old saying "Knowledge is power." The Lord Mayor having moved the adoption of the Report, the Resolution was seconded by

Mr. Harry Nuttall, M.P., F.R.G.S., the President of the Society, who observed that the Report showed the same activity which was characteristic of geographers wherever they were found. They were naturally restless creatures, either roving about the world themselves or discussing what had to be done by others. Useful work must be done even in war-time.

Twenty-six lectures had been given to the members of the Society during the winter months on a great variety of subjects. They had voyaged round the planet, and visited amongst other places, in the mind's eye, the Panama Canal, and then sailed across the Pacific Ocean to explore the Japanese Alps. On the way home they had made an investigation into the condition of Persia. As to the Accounts, he thought that they would be considered satisfactory, as there was only a sum of £3. 3s. 6d. on the wrong side. But their ambition to number 1,000 members had not yet been achieved. They had now 686; if they had the 1,000 they could do much more and better work.

Turning to exploration work, Mr. Nuttall said that geographers were as busy as ants all over the globe. There was good reason for this, for although the general features of the world were known from pole to pole and around its

circumference, the amount of detailed work to be done had no limit, and it could never be finished. Geography included practically everything; we began with the earth, and it led us to everything on the earth; the mysteries of this wonderful planet could never be solved.

Sir Aurel Stein was still going on with his work under the auspices of the Indian Government, on the Pamirs and in Central Asia, where he was engaged in various investigations, such as the old Chinese defences, and on the geodetic survey of those regions. Cavaliere de Fillipi, an Italian, was engaged on gravity and physical observations in the Himalayas. Count de Voisin and Lartigue were engaged on archæological and survey work on behalf of France in Western China. In Africa Dr. Cuthbert Christie was occupied in Zoological investigation. Mr. R. J. Flaherty was at work on the exploration and survey of the Hudson Bay region, and Mr. S. P. Fay in the Canadian Rockies.

The United States Geological Survey was proceeding in Alaska, and exploration work was also being done in Brazil. A portion of the Royal Geographical Society's map of Europe and the adjacent parts of Asia and Africa on the one millionth scale, by order of the War Office, was now on sale to the public. This was a most important work.

All these things gave some idea of the industry of explorers of various nations, and of the extent of the field for the enterprise and courage of explorers, both in connection with science and the development of trade. The Manchester Geographical Society was practically founded for commercial reasons, for the study and development of commercial geography. The importance of this study and development was realized when they thought, for example, of the African Continent, which covered one-fifth of the land area of the world, with its thousands of miles of elevated plateau which was habitable by white men. In connection with Africa it was worth noting that German East Africa, which the Germans were about to lose, was a very fine territory, with an area of 384,000 square miles, almost three times the size of Prussia. He thought the Germans would have been much better occupied in developing that territory than in building strategic railways on the Belgian and Russian frontiers. There were great possibilities of development, too, in the immense area of Russia, with its 3,000 lineal miles from the

Ural Mountains to the Pacific Ocean, added to its 1,500 miles on the European side of those mountains. Again, there was an immense field in China. In these countries there were vast stores of wealth of all kinds—metallurgical and agricultural—to be developed, and the nations certainly need not yet quarrel about a field for their enterprise.

Mr. Nuttall next referred to the anxiety felt about that brave and remarkable man, Sir Ernest Shackleton. The difficulties of landing on the coast in the Weddell Sea were great indeed. The ice shifted about a great deal, and the fear was that the "Endurance" might be locked in or drifted away as did the "Aurora." However, he had a telegram from the Royal Geographical Society, which said that Shackleton might have crossed the Antarctic Continent from the Weddell Sea to the Ross Sea, which would be the very best news they could receive. The "Aurora" left a large quantity of food, and there was always food to be got from seals. An Advisory Committee had been appointed to send out a relief ship to search for the "Endurance," and he expected that the "Aurora" would also be able to go back to the Ross Sea. In that case there would be one expedition to one side of the Antarctic continent and another to the Ross Sea side, so there would be every chance of reaching Sir Ernest Shackleton and giving him whatever succour he needed.

Speaking, in conclusion, of the general condition of affairs in the world, Mr. Nuttall remarked that it was gratifying to note that the Brazilian papers had expressed a desire for the formation of a league of neutrals under the ægis of the United States. This gave one hope that after this dreadful war the human race would realize that there was much better work to be done than acting like savages and slaying one another, and that the nations would join together to restrain any evil-doer who attempted to break the peace.

The Right Rev. Bishop Welldon (Dean of Manchester), in supporting the resolution, which was carried unanimously, congratulated Mr. Nuttall upon his very interesting address, and expressed hearty agreement with the Lord Mayor's hope that the number of members of the Society would soon be increased. One result of the present disastrous war must be to extend the interest of humanity in geographical science. Just take the case of the men who had gone out of the city of Man-

chester to the far parts of the world. What they saw would be to them a veritable revelation, and after they had seen the Nile, Gallipoli, or whatever other places they had been sent to, they could not come home holding the same narrow views they set out with. Their experience must stimulate them to take a wider and deeper interest in the countries of the world. It was possible that the Germans were learning a little geography too. No event of the war was so remarkable as that, in a few weeks, the whole German colonial empire would be wiped off the face of the earth. People here talked about a success here and a reverse there, but there was nothing like that magnificent achievement. That achievement had been due to the work of the British Navy. It should be remembered that one of the great objects of the Kaiser had been to build up a Colonial Empire. It was said that Germany was a self-supporting country, but could any country be self-supporting at present, could any nation be cut off for two years from trade overseas without suffering gigantic loss? Finally, the Dean pointed out that the scientific study of geography was a vital matter to Manchester, whose trade reached all over the world. That being so, he hoped Manchester would send more and more recruits to the membership of the Society, so that they would be ready for those days of great import which would begin when the war was over.

The Secretary having announced that all the retiring Officers and Council had been nominated for re-election, they were duly elected and thanked for the work they had done in the past year, on the motion of Mr. Ewin Pickstone, seconded by the Rev. W. H. Leak. (See List of Officers and Council with the Title Page.)

Mr. T. W. Sowerbutts, F.S.A.A., then moved "that the best thanks of the Society be given to Mr. T. Gregory, F.C.A., J.P., for his services as Honorary Auditor, and that he be re-elected." Mr. Sowerbutts said that there had now been issued thirty-one Annual Balance-Sheets of the Society, and to every one of those Mr. Gregory's name was attached as honorary auditor. He thought that was unique even in Manchester, the city of unique things. Mr. W. A. M'Grath seconded the resolution, which was passed unanimously.

Mr. Joel Wainwright, J.P., proposed "that the best thanks of this Meeting be tendered to the Right Hon. the Lord Mayor for the use of the room and for presiding over the meeting." Mr. Wainwright said that the interest which suc-

cessive Lord Mayors of Manchester had shown in the Society was a great encouragement to the members. There never was a time in the history of the world, he continued, when a knowledge of geography was more important than it was to-day. There were very few of us, he was sure, who could understand all the places which were named in the newspapers every morning, and therefore it was of vital importance that we should all become geographers. This was necessary not only for the purpose of maintaining the integrity of our own Empire, but also that we might know where and what other people were doing. After the war there would be great questions involved in geography in regard to trade. We could not live in this country in our old comfortable style unless we knew where to send the produce of our artisans and clever and ingenious inventions.

Mr. E. W. Mellor, J.P., F.R.G.S., in seconding the resolution, said that the Lord Mayor had referred to applied geography in relation to the commerce of this city. Although the Executive Committee had not altogether lost sight of that, they were bound besides making lectures instructive to ensure that they should be attractive and should afford some pleasure. But as indicating what they were doing in the direction mentioned by the Lord Mayor, he might mention that they were privileged to have had visit them a Commissioner from Nigeria, who told them what that country was able to export, and also what, in the process of time, it might be able to absorb. The Executive Committee, he thought they would agree, had provided very good fare in the way of lectures, and managed it thriftily and with due regard for economy. It was essential, however, if they were to keep up their standard that they should keep up their membership. An experiment tried in the past season was that of having an afternoon meeting in the hope of attracting members who lived a considerable distance from the city. That experiment proved so successful that he hoped the executive would see their way to having afternoon meetings occasionally.

The resolution was adopted with acclamation. The Lord Mayor, after acknowledging the resolution, intimated that he would be pleased to become a member if the President would propose him. This announcement was received with applause, and on the motion of the President, seconded by Bishop Welldon, a resolution was unanimously carried electing the Lord Mayor a member.

Proceedings of the Society.*

January 1st to December 31st, 1916.

The 1,004th Meeting of the Society was held on Tuesday, January 4th, 1916, at 7.30 p.m. Mr. D. A. Little in the Chair.

The Minutes of the Meetings held on December 14th and 17th were taken as read.

The Chairman announced the election of Lieut. H. C. Handcock, R.N.R., and Dr. Edgar Grey as Corresponding Members, and of Miss R. Robinson as an Ordinary Member.

Mr. J. Ernest Phythian gave a lecture on "The Spell of the Mountains," and concluded by showing a large number of lantern views, including copies of many of the pictures in the Art Gallery.

The usual vote of thanks was passed.

The 1,005th Meeting of the Society was held jointly with the University in the Whitworth Hall, on Tuesday, January 11th, 1916, at 8.0 p.m. Prof. G. Elliot Smith, M.D., F.R.S., presided.

Miss M. A. Czaplicka, F.R.A.I., gave a lecture on "Siberia and some Siberians." (See page 27.) The lecture was illustrated with a large number of lantern views of photographs taken on the journey.

On the motion of the Vice-Chancellor of the University (Sir Henry A. Miers, D.Sc., F.R.S.), seconded by Mr. J. Stephenson Reid, of Nicholls Hospital, it was unanimously resolved that the hearty thanks of the Meeting be given to Miss Czaplicka for the intensely interesting account which she had given of her journey and of the tribes visited by her, and for the numerous illustrations shown.

The 1,006th Meeting of the Society was held on Tuesday, January 18th, 1916, at 7.30 p.m. In the Chair, Mr. E. W. Mellor, J.P., F.R.G.S.

The Minutes of the Meetings held on January 4th and 11th were taken as read.

The Chairman announced the election of Mr. A. S. Mindel as an Ordinary Member, and of Miss G. E. Livesley and Miss M. Wanstall as Associate Members, and mentioned the loss by death of Mr. W. A. Arnold, one of the Original Members of the Society. A resolution of sympathy with the relatives of Mr. Arnold was passed.

Mr. W. E. B. Copland-Crawford, F.R.G.S., gave a lecture on "Nigeria" (see Vol. XXXI, page 1). The lecture was descriptive of his experiences during his seventeen years' residence in that country, and specially dealt with the progress made by the natives in that period. The lecture was illustrated with many original lantern views.

A vote of thanks to the lecturer was passed unanimously.

* The Meetings are held in the Geographical Hall, unless otherwise stated.

The 1,007th Meeting of the Society was held on Tuesday, January 25th, 1916, at 7.30 p.m. Mr. J. Howard Reed, F.R.G.S., presided.

The Minutes of the Meeting held on January 18th were taken as read.

The Rev. A. B. Fisher, M.A., F.R.G.S., gave a lecture on "Twenty-three Years Among Central African Tribes." He compared the condition of Uganda as it was when he first went with its present state, and mentioned many interesting incidents of his life in Central Africa, illustrating his remarks with many lantern views mainly from his own photographs, though some of the Ruwenzori Glaciers had been given to him by the Duke of Abruzzi. He concluded by showing some slides kindly lent by the Royal Geographical Society, which had been prepared for Sir Harry Johnston, showing the political map of Africa as it was in July, 1914; as it might have been in 1916 if Germany had proceeded peacefully; and as it may be when the War is finished.*

* See "Geographical Journal," April, 1915.

On the motion of the Chairman, it was resolved that a hearty vote of thanks be given to the lecturer for his very interesting and instructive address, and for the slides with which it was illustrated, and to the Royal Geographical Society for the loan of the supplementary slides of Africa.

The 1,008th Meeting of the Society was held on Tuesday, February 1st, 1916, at 7.30 p.m. In the Chair Mr. D. A. Little.

The Minutes of the Meeting held on January 25th were taken as read.

The Rev. A. W. Fox, M.A., gave a lecture on "Truth and Tradition in Tyrconnell," with lantern illustrations from his own photographs.

A vote of thanks to the lecturer was passed unanimously.

The 1,009th Meeting of the Society was held on Tuesday, February 8th, 1916, at 7.30 p.m. In the Chair, Mr. Charles A. Clarke.

The minutes of the meeting held on February 1st were taken as read.

Mr. John Hilditch, M.R.A.S., gave a lecture on "War: a Preserver of Chinese Art; Historic Finds, with lantern illustrations from the Hilditch Collection." Mr. Hilditch gave a comprehensive account, admirably condensed, of Chinese history, including some of the wars which have been waged, and caused many works of art to be buried for safety, to be unearthed in later times, some quite recently. He had been fortunate in obtaining possession of many of these, and had photographs of some of them shown on the screen. (See page 43.)

The Members passed a hearty vote of thanks to the lecturer.

The 1,010th Meeting of the Society was held on Tuesday, February 15th, 1916, at 7.30 p.m. In the Chair, Alderman J. R. Ragdale, J.P.

The Minutes of the Meeting held on February 8th were taken as read.

The Chairman announced the election of the following Members:—Ordinary: Mr. A. L. Arnold; Associate: Miss A. M. Osborn and Miss Woodhead; and read the following letter which the Secretary had received from Lieut. C. V. Groves, R.N.R., at the Hague:

"I should be glad if you would kindly convey my thanks to Colonel Crook

for his kindness in nominating me, and to the Council of the Geographical Society for electing me a Corresponding Member.

"I have not had the good fortune to be able to attend any of the Society's lectures since the outbreak of war, but previous to that I did attend several and thoroughly enjoyed them. The unfortunate disaster that overtook my submarine, E. 17, has, I am afraid, put me *hors de combat* for the rest of the war, but still, like the rest, I live in hopes."

Mr. Ewin Pickstone gave a lecture on "The Homes and Haunts of the Lancashire Witches," and illustrated the paper with a large number of lantern views, mostly from his own photographs.

Mr. Ginger moved, the Chairman seconded, and it was resolved, that a hearty vote of thanks be given to Mr. Pickstone.

The 1,011th Meeting of the Society was held on Tuesday, February 22nd, 1916, at 7.30 p.m. In the Chair, Mr. Harry Nuttall, M.P., F.R.G.S.

The Minutes of the Meeting held on February 15th were taken as read.

The Rev. F. C. Smith, M.A., F.R.G.S., gave a lecture on "The Possibilities of Remoter Canada," and illustrated his remarks with many lantern slides, one-third being kindly lent by the Colonial and Continental Church Society and another third from a set of slides presented to the Manchester Geographical Society by the Manchester Chamber of Commerce; the remainder were prepared from negatives belonging to the lecturer.

Mr. R. A. Staniforth moved, Mr. Thos. Barningham seconded, and the Chairman supported, a hearty vote of thanks to the lecturer for the very interesting account of his life in Western Canada and his ideas of the future of that country, and for the slides with which it was so well illustrated.

The 1,012th Meeting of the Society was held on Tuesday, February 29th, 1916, at 7.30 p.m. In the Chair, the Rev. W. H. Leak.

The Minutes of the Meeting held on February 22nd were taken as read.

The Chairman mentioned the death of the Rt. Hon. J. F. Cheetham, Member of the Council, and Member of the Society since 1890, and asked the Members to show their sympathy with his relatives by rising in silence.

Mr. H. Norman Edge gave a lecture on "Weather and Weather Recording," and illustrated his address with a large number of lantern views.

A hearty vote of thanks was tendered to the lecturer.

The 1,013th Meeting of the Society was held on Tuesday, March 7th, 1916, at 7.30 p.m. In the Chair, Mr. James Williams.

The Minutes of the Meeting held on February 29th were taken as read.

The Chairmen mentioned that he was pleased to say that the Vice-Chairman of the Council was now convalescent after his recent severe attack of congestion of the lungs.

Mr. Levi Powell, of Torquay, gave a lecture on "Glorious Devon." He dealt specially with South Devon, and referred to Exeter, Dawlish, Teignmouth, Torquay, Paignton and Dartmouth. He described very fully Torquay and its surrounding beauty spots. The lecture was well illustrated with a large number of coloured lantern views.

The Chairman, on behalf of the Meeting, thanked Mr. Powell for his interesting address.

The 1,014th Meeting of the Society was held on Tuesday, March 14th, 1916, at 7.30 p.m. In the Chair, Colonel H. T. Crook, D.L., J.P.

Dr. A. Wilmore, F.G.S., gave a lecture on "Coast Lines: A Study in Geography." The address was illustrated by the good orographical maps of Europe, North and South America issued by E. Stanford, by a small sketch map of the Iberian Peninsula prepared by the lecturer, and by a large number of lantern views.

A hearty vote of thanks was accorded to the lecturer.

The 1,015th Meeting of the Society was held on Tuesday, March 21st, 1916, at 7.30 p.m. In the Chair, Mr. J. Stephenson Reid.

The Minutes of the Meeting held on March 14th were taken as read.

The death of Mr. Ivan Levinstein was announced, and a resolution of sympathy with his relatives was passed, those present rising in silence.

Mr. S. W. Williams, C.A., gave some "Glimpses of Life and Scenery in the Middle and Far West of the United States of America." His address was well illustrated with many lantern views.

It was unanimously resolved, on the motion of the Chairman, that the hearty thanks of the Meeting be given to Mr. Williams for his interesting and humorous description of incidents met with on his various journeys in the United States, and for the illustrations shown.

The 1,016th Meeting of the Society was held on Tuesday, March 28th, 1916, at 7.30 p.m. In the Chair, Mr. J. E. Balmer, F.R.G.S.

The Minutes of the Meeting held on March 21st were taken as read.

The Chairman drew the attention of the Members to the proposal to arrange a Vacation Course in August at the Oxford School of Geography if a sufficient number of applications are received.

Mr. Fred Eastwood gave a lecture on "Picturesque Yorkshire." The lecture was illustrated with a splendid collection of photographic views shown by the Society's electric lantern.

The proceedings concluded with a hearty vote of thanks to the lecturer.

The 1,017th Meeting of the Society was held on Friday, March 31st, 1916, at 3.0 p.m. In the Chair, Sir S. W. Royse, J.P.

The Rev. Canon Parfit, M.A., gave a lecture on "Mesopotamia," illustrated with many lantern views.

Mr. George Thomas, J.P., moved and the Chairman seconded a resolution expressing the thanks of the Meeting to the Canon for his intensely interesting and informing lecture.

The 1,018th Meeting of the Society was held on Friday, March 31st, 1916, at 7.30 p.m. Mr. J. Stephenson Reid presided.

The Rev. Canon Parfit, M.A., repeated his lecture on "Mesopotamia," with the lantern illustrations.

On the motion of the Chairman, a hearty vote of thanks was passed to the lecturer for his lecture and for the illustrations shown.

This meeting and the preceding one were open to non-members on the same terms as members, the tickets being 1/- each.

A short report of the afternoon lecture here follows :—

"Canon J. T. Parfit, who has laboured for more than twenty years in Syria and Turkish Arabia, gave an address on Mesopotamia to the members of the Manchester Geographical Society on Friday afternoon, March 31st.

"Canon Parfit said the development of the present terrible war in the East was a phase in the great Germanic plan to extend the power of Germany in that direction. She had made no secret of her intentions to extend her sway right from the North Sea through Europe, Constantinople, Asia Minor, and Syria, down to the Persian Gulf, and still further beyond. The Bagdad Railway system was essential to this scheme, and he had seen in a furnished house in England, which he occupied after a German family, a geographical globe on which the line was marked out as entirely under German control, with the naval bases that were to be set up. Germany, he said, had always persistently interfered with every endeavour to compel the Turks to put an end to the atrocities in Macedonia, because it was in her interest to allow them to rule there, so as to keep in direct touch with European Turkey. In order to enable her to accomplish her scheme it was necessary to make a compact with the Sultan of Turkey, and the new German-Bagdad Railway agreement had been completed since the outbreak of the war for the purpose of giving Turkey her reward for all the facilities she was giving to the German schemes. If these schemes were realised the Turks were to be given Egypt, and Cairo was to be made again the great capital of the Turkish Empire.

"English people, Canon Parfit said, were depressed at the position occupied by our forces at Kut-el-Amara. His view was that rather than a disaster that expedition would prove to be one of the most interesting pieces of triumphant strategy on the part of Great Britain and her Allies that we had been privileged to see since the outbreak of the war. It had stopped the invasion of Egypt, and had materially assisted the Russians in their advance to Erzerum." ("Manchester Guardian.")

The 1,019th Ordinary Meeting of the Society was held on Tuesday, April 4th, 1916, at 7.30 p.m. Mr. J. McFarlane, M.A., M.Com., F.R.G.S., presided.

The Minutes of the Meetings held on March 28th and 31st (at 3.0 p.m. and 7.30 p.m.) were taken as read.

The Chairman announced the loss by death of Mrs. Eli Sowerbutts, Honorary Member, and of Miss Crowther, Ordinary Member, and those present gave expression to their sympathy with the relatives of the deceased members by rising in silence.

Dr. J. Scott Keltie, F.R.G.S., gave a lecture on "Geographical Progress of the last Half Century." The address was illustrated with lantern slides of maps and views (see p. 55).

Colonel H. T. Crook, D.L., moved, the Rt. Rev. Bishop Welldon, D.D., seconded, and it was unanimously resolved, that the hearty thanks of the Society be given to Dr. Scott Keltie for his instructive address.

The 1,020th Meeting of the Society was held on May 9th, 1916, at 7.30 p.m. In the Chair, the Rev. J. G. Maude.

The Minutes of the Meeting held on April 4th were taken as read.

The Chairman announced the election of Miss Mildred Evans as an Ordinary Member, and of Messrs. Harry Herd and W. D. Woods as Corresponding Members on joining His Majesty's Forces; and also the loss by death of Mrs. Gumbrell and Mr. Harry Herd, to whose relatives letters of condolence had been sent by direction of the Council.

The Rev. J. H. Burkitt gave a lecture on "Some Shakespearian Places," illustrating his remarks with many lantern views. A Syllabus of the lecture here follows :—

"Part I. The Shakespeare Country.

"The County of Warwick—Queen Elizabeth at Kenilworth—was young Shakespeare there?—Stratford-on-Avon—Antiquity of the Borough—Shakespeare's birthplace—Life in Stratford—Anne Hathaway's Cottage—Life in London—Globe Theatre—Memorial in Southwark Cathedral—Return to Stratford-on-Avon—Death and resting place. Stratford Portrait—Memorial Buildings—Droeshout and Chandos Portraits.

"Part II. The Locality of some of the Plays.

"Did the poet travel on the Continent?—Geographical inaccuracies—The *locale* of certain scenes taken from the Roman Plays, the Comedies, the Histories and the Tragedies."

On the motion of Mr. R. A. Staniforth, seconded by the Chairman, it was unanimously resolved that the hearty thanks of the Meeting be given to the lecturer for his intensely interesting and instructive address.

The 1,021st Meeting of the Society was held on Tuesday, October 17th, 1916. Mr. E. W. Mellor, J.P., F.R.G.S., took the Chair at 7.30 p.m.

The Minutes of the Meeting held on May 9th were taken as read.

The election of the following Members was announced :—Ordinary : Miss Tinker (Life), the Rt. Hon. the Lord Mayor (Alderman Smethurst); Associate : Miss E. E. Warburton, B.A.; Corresponding : Staff-Sergeant H. Shorrocks.

The Chairman mentioned with great regret the loss by death of the following members :—Messrs. J. Howard Reed, F.R.G.S. (late Hon. Secretary and Vice-President), Francis Ashworth, J.P., J. K. Bythell, J.P., W. V. Blaikie, H. Janus, Ziba A. Ward and S. W. Williams, and Captain W. Morton Johnson, F.R.G.S. (Life Member) on active service. Letters of condolence had been sent, by direction of the Council, to their relatives.

It was resolved to take as read the address by the President of the Geographical Section, and the Report of the Delegate of the Society to the British Association at Newcastle, Sept. 5th to 9th, 1916 (see pp. 81 and 102).

Dr. James Johnstone, of the Fisheries Laboratory, Liverpool University, gave an address on the "Gulf Stream and the Weather," and illustrated his remarks with a series of very clear lantern slides.

The Chairman, on behalf of the Meeting, tendered hearty thanks to Dr. Johnstone for his very interesting and instructive lecture.

Here follows a short notice of the late Mr. J. Howard Reed, F.R.G.S., Vice-President and late Hon. Secretary of the Society :—

"The death of Mr. John Howard Reed, which, we regret to say, occurred at his home, Shirley, Heald Place, Rusholme, on Monday last, deprives the Manchester Geographical Society of one of its most active members. For more than a quarter of a century he laboured unceasingly for the Society, and strove to impress upon the community of Manchester and district the importance to it of a sound knowledge of geographical science, especially in its relation to commerce and civilisation. He became a member of the Society when quite a young man through coming into contact with the late Mr. Eli Sowerbutts, the real founder of the Society, a spark of whose enthusiasm, as he once expressed it, kindled in him a strong desire to spread the gospel of geography. Mr. Reed was a Vice-President of the Society, and for many years one of its Honorary Secretaries. In the work of the Victorian section he particularly interested himself. The members of this section travel about the North delivering lectures—giving their services freely—on geography in the widest sense of the word, their subjects including astronomical matters, rambles in the highways and byways of the United Kingdom, and travels in almost every corner of the earth. Mr. Reed himself delivered hundreds of lectures on numerous aspects of geography, and contributed scores of articles to journals and magazines. Two series of articles which he wrote for the old 'Manchester Evening Mail' were republished in book form, one of the volumes dealing with Fashoda, and the other with the Transvaal. His labours on behalf of geography were warmly appreciated by his fellow-members, who also recognised Mrs. Reed's share by presenting her with a handsome piece of silver. In 1906 he was made a Fellow of the Royal Geographical Society, his colleagues of the Manchester Society, on their own initiative, nominating him for the honour. He did much valuable work also for the British Cotton Growing Association, and lectured on cotton growing before the British Association for the Advancement of Science. Mr. Reed was fifty-seven years of age.

"The funeral took place yesterday at the Southern Cemetery, and there attended as representatives of the Manchester Geographical Society Dean Welldon, Mr. E. W. Mellor, Colonel H. T. Crook, Mr. D. A. Little, Mr. C. A. Clarke, Mr. J. S. Reid, Mr. A. Balmforth, Mr. J. H. Bentley, Mr. Egbert Steinthal, Mr. W. H. Ward, Mr. Harry Sowerbutts, and Mr. T. W. Sowerbutts. A deputation was present from the Vulcan Boiler and General Insurance Company, including Mr. Frank Bullock, Mr. F. J. Payton, Mr. D. Smart, Mr. West, and a number of other engineers and members of the clerical staff. Dr. Prince Stallard was also present. The service at Christ Church, Moss Side, and at the cemetery was conducted by Dean Welldon and the Rev. J. W. Challenor." ("Manchester City News," May 20th, 1916.)

The 1,022nd Meeting of the Society was held on Tuesday, October 24th, 1916. Mr. J. Stephenson Reid took the Chair at 7.30 p.m.

The Minutes of the Meeting held on October 17th were taken as read.

The Rev. J. H. Burkitt gave a lecture on "Cornish Scenery and Romance," and illustrated his address with many fine lantern views.

Syllabus:—"Cornish Superstitions and Cornish Cream. Falmouth in the olden times. Phœnician Traders. Exquisite Scenery. St. Maws. The Manacles. Wreck of the 'Paris.' River Fal (Miniature Rhine). Truro and its

Cathedral. Redruth and Carn Brea. Perran Porth. The Wreckers. Kynance Cove. St. Michael's Mount. Penzance. The famous Logan Rock. A Fool-hardy Trick. Ladies' Wishing Chair. Land's End. Ancient Remains. Nature's Sculpture. First and last Refreshment House. Rocks at Cape Cornwall. Sublime Heroism. Legend of the Three Kings. Scilly Coast. Lost Land of Lyonesse. Newlyn. Fowey Harbour and Castle. Polperro. Queen Zenobia. The old Smuggling days. Well of St. Keyne. Newquay. Boscastle and Bude. Tintagel and the Arthurian Legends."

On the motion of the Chairman, a hearty vote of thanks was passed to the lecturer.

The 1,023rd Meeting of the Society was held on Tuesday, October 31st, 1916. Mr. Hermann Woolley, F.R.G.S., took the Chair at 7.30 p.m.

The Minutes of the Meeting held on October 24th were taken as read.

The Chairman mentioned the death of Mr. Joel Wainwright, J.P., Member of the Society for 25 years, and a resolution of sympathy with his relatives was passed by all present rising in silence.

The election of the following members was announced :—Ordinary : Mr. S. C. Battershill; Associate : Miss J. Hawthorne, Miss E. B. Herriot, Mrs. M. M. Hilton, Mrs. R. W. Nuttall, and Mr. T. H. B. Sowerbutts.

The Rev. Walter Weston, M.A., F.R.G.S., First Foreign Member of the Japanese Alpine Club, a resident for many years in Japan, described "Fuji-yama, the Matchless Mountain of Japan," illustrating his remarks with a series of beautifully coloured lantern pictures. He first dealt with the origin of its name, Fuji-yama or Fuji-san, as it is more often called, and its history, showing copies of the earliest views now in existence, and mentioned the various eruptions which had taken place, the last in 1706. He described the ascent of the mountain by the pilgrims, of whom thousands, draped entirely in white garments, ascend during the summer (from the middle of July to middle of September), the mountain being closed during the remainder of the year, when it is more or less covered with snow, and no porters or guides are available during the closed period. He showed views of the lovely lakes, waterfalls, lava streams and ice caves seen during the ascent, and of the old and new, side by side, ancient shrines and modern alpine huts. And at about 12,000 feet up (about 400 feet below the summit) the principal shrine was faced by a modern post-office. He then described a descent into the crater, several hundred feet deep by Mrs. Weston and himself, the chief keeper of the shrine accompanying them for *his* first descent. The photograph, a copy of which was shown on the screen, taken by Mrs. Weston at the bottom of the crater, is the only one ever taken there, and on returning to the shrine the keeper presented her with a gold medal in recognition of the fact that she was the first lady to descend the crater. Mr. Weston described some of the seven ascents made by him, sometimes accompanied by his wife, and usually in bad weather if made during the closed season. On one occasion, when he, with two friends, climbed the mountain, they descended the opposite side, and, during the ascent, a typhoon burst on the mountain, so it was thought that they had all perished. As he was getting into the train for Kobe a foreign acquaintance put into his hands a newspaper containing an account of a disaster on Fuji-san. It stated that

some foreign travellers, evidently British, as they alone take pleasure in such risks, had ascended the mountain. Shortly after a violent storm broke over it, and as days had passed without the travellers returning to the village they had without doubt perished miserably. And he had the further pleasure, later on, at intervals, of reading translations from native papers commenting on the catastrophe and picturing the tale of their destruction.

On the motion of the Chairman, a hearty vote of thanks was passed to the lecturer for his interesting, instructive and entertaining account of the mountain.

The 1,024th Meeting of the Society was held on Tuesday, November 7th, 1916. Mr. George Ginger occupied the Chair at 7.30 p.m.

The Minutes of the Meeting held on October 31st were taken as read.

The Chairman announced that the Society was greatly indebted to the late Miss Crowther, and to Mr. Edwin Schofield, J.P., who had sent a cheque for £100 in accordance with a wish that this amount should be given to the Society out of her estate, expressed by the late Miss Crowther, who died intestate.

Mr. James Shaw, F.R.P.S., gave a description of "The Picturesque Side of a Great City," illustrating his remarks with slides from original and often unusual photographs of Manchester scenes. This collection of slides was the result of over twenty years' pictorial photographic work in Manchester.

Mr. Ginger moved, and it was unanimously resolved, that the hearty thanks of the meeting be given to Mr. Shaw for his interesting and entertaining address and for the unique slides shown.

The 1,025th Meeting of the Society was held on Tuesday, November 14th, 1916, at 7.30 p.m. Mr. E. W. Mellor, J.P., F.R.G.S., presided.

The Minutes of the Meeting held on November 7th were taken as read.

The election of Misses S. A. and Florence Staniforth as Associate Members was announced.

The Rt. Rev. Bishop Hanlon (late of Teos, Uganda, and formerly of Ladak) gave a lecture on "Life in Ladak." Lantern views of Murree and Kashmir, including many of Ladak, were shown.

On the motion of the Rt. Rev. the Bishop of Salford, seconded by the Chairman, a hearty vote of thanks was passed to Bishop Hanlon for the very interesting account which he had given of his experiences in Murree and Ladak, including descriptions of the social customs and religions of the people, and of his journeys among the mountains of Kashmir.

The 1,026th Meeting of the Society was held on Tuesday, November 21st, 1916, at 7.30 p.m. Mr. J. Stephenson Reid presided.

The Minutes of the Meeting held on November 14th were taken as read.

The Chairman said that by request of the Council he reminded those present that Thursday, November 23rd, would be the Tercentenary of the death of the celebrated English geographer, Richard Hakluyt, and it was felt that such an important event should not pass without due note being taken of the same.

The Rev. J. G. Maude, M.A., in a lecture entitled "A Tour in Eastern

Canada," gave a description of a journey made by him in Eastern Canada in connection with the Congress of the Chambers of Commerce of the Empire, and also described the journey across Canada to Vancouver taken by the majority of the members of the Congress. His address was illustrated with about 150 slides, prepared specially by the Canadian Government and presented by them to the Manchester Chamber of Commerce, who had kindly given them to the Society to add to their large collection. The slides of the Rocky Mountains were especially admired.

On the motion of the Chairman, a hearty vote of thanks was passed to the lecturer for the interesting account of his journey, and for so ably describing this fine collection of slides.

The 1,027th Meeting of the Society was held on Tuesday, November 28th, 1916, at 7.30 p.m. Mr. J. E. Balmer, F.R.G.S., presided.

The Minutes of the Meeting held on November 21st were taken as read.

The Chairman mentioned the loss by death of Sir Samuel Walter Royse, J.P., and a resolution of sympathy with Lady Royse and other relatives was passed by all rising in silence.

The election of Mr. Thomas Bromiley as an Ordinary Member was announced.

Mr. Joseph Burt, F.R.G.S., gave a lecture entitled, "My Thousand Miles along the Great Slave Route." He described his visits to the Portuguese Islands in the Gulf of Guinea, and then into the interior of Portuguese West Africa to see under what conditions the natives worked in the islands and in what manner they were recruited in the interior of the continent, and he obtained many proofs that it was by slavery. As a result of his investigations there is every hope of an improvement in the conditions described by him. He illustrated his remarks with a large number of lantern views from photographs taken on the journey, including many fine views of beauty spots which he saw.

The Chairman, on behalf of the Meeting, offered hearty thanks to Mr. Burt for his very interesting account of the journey.

The 1,028th Meeting of the Society was held on Tuesday, December 5th, 1916. The Chair was taken by Mr. D. A. Little, at 7.30 p.m.

The Minutes of the Meeting held on November 28th were taken as read.

A letter was read from Lady Royse acknowledging with sincere thanks the resolution of sympathy passed at the last meeting.

The Rev. A. W. Fox, M.A., gave a lecture on "In the Heart of the Pennines," illustrating his remarks with his own photographs of clough and moorland scenery, and concluding with a short description of scenes associated with the Brontë Sisters.

On the motion of the Chairman, a hearty vote of thanks was passed to the lecturer for his interesting, racy and instructive account of some of the country within reach of Todmorden.

The 1,029th Meeting of the Society was held on Tuesday, December 12th, 1916. Mr. J. E. Balmer, F.R.G.S., took the Chair at 7.30 p.m.

The Minutes of the Meeting held on December 5th were taken as read.

The Chairman intimated that a proposal had been made to begin the meetings at 7.0 p.m. in the new year in view of the proposed train restrictions, and asked those present for their opinion.

It was resolved that the Council be requested to consider the possibility of arranging for the Meetings to begin at 7.0 p.m. in future.

Mr. Fred Eastwood gave a lecture on "A Visit to Lisbon," illustrated with lantern views from his own photographs.

On the motion of the Chairman, it was unanimously resolved that the hearty thanks of the Meeting be given to Mr. Eastwood.

The 1,030th Meeting of the Society was held on Friday, December 15th, 1916, at 6.0 p.m., and took the form of a lecture to the children of the members and their friends. Mr. E. W. Mellor, J.P., F.R.G.S., presided.

Dr. A. Wilmore, F.G.S., gave a lecture on "The Story of a Water-Drop," and illustrated his address with experiments illustrating some of the properties of water, and its changes into ice and steam, and also with a large number of beautiful lantern views.

The Chairman asked the children to show their appreciation of Dr. Wilmore's address, of the experiments which were all successful, and of the lantern views exhibited; and they responded by rounds of hearty applause.

List of Maps, Books, Journals, etc.,

ACQUIRED BY THE SOCIETY

FROM JANUARY 1st TO DECEMBER 31st, 1916.

Maps.

EUROPE.

- New Coloured Plan of Newcastle-upon-Tyne, including Gosforth and Walker. Scale, 6 inches to 1 mile. Newcastle-upon-Tyne: Andrew Reid and Co., 1914.
- Norway. Katalog over Norske Sjøkart, den 1 Januar, 1916. Kristiania: 1916. *Norges Geografiske Opmaaling.
- Norway. Geologisk Oversigtskart over det sydlige Norge. Norges Geologiske Undersøkelse, 1915. Maalestok 1/1,000,000. Kristiania: Norges Geografiske Opmaaling, 1915. *Norges Geografiske Opmaaling.
- Norway. Landgeneralkart over Norge. 1/250,000. Blad LV, Kristiania. Kristiania: Norges Geografiske Opmaaling, 1915. *Norges Geografiske Opmaaling.
- Norway. Topografisk kart over Kongeriget Norge. L 12, Sörfold; 9 C, Skien; 14 B, Moss; 15 C, Fet; 23 A, Voss; 26 A, Hamar. Maalestok 1/100,000. Kristiania: Norges Geografiske Opmaaling, 1914-15. *Norges Geografiske Opmaaling.

AMERICA.

- British Columbia, Mining Divisions. Scale, 50 miles to 1 inch. Victoria: British Columbia Department of Mines, 1914. *The Minister of Mines.
- The Hudson-Mohawk Gap. Scale, 1/1,250,000. Prepared for the London School of Economics and Political Science by the Diagram Co. from a map by B. B. Dickinson. London: School of Economics. *Messrs. Sifton, Praed & Co., Ltd., London.

ATLASES, PHOTOGRAPHS, Etc.

- Barograms recorded by the Right Rev. the Bishop of Salford's Barograph, at St. Bede's College, Alexandra Park, Manchester. Vol. II, 19th May, 1913, to 10th June, 1916. (With a few unavoidable gaps.) *Rt. Rev. the Bishop of Salford.
- Newcastle-upon-Tyne. A Sketch Book containing 24 page reproductions in facsimile from pencil drawings by Robert J. S. Bertram. London: A. and C. Black, 1914.
- Newcastle-upon-Tyne. Eighteen Picture Postcards.
- Whitley Bay. Nine Picture Postcards.
- Twenty-nine Lantern Slides of the Panama Canal. *Mr. Wm. Eller.

* Donor.

Books.

Books presented as a Memorial to Mr. and Mrs. Eli Sowerbutts are indicated as follows :—*(Mr. and Mrs. E. S. M. 1).

GENERAL.

- The Ocean : A General Account of the Science of the Sea, by Sir John Murray, K.C.B., etc. Maps and Illustrations. London : Williams and Norgate, 1913. *(Mr. and Mrs. E. S. M. 29).
- The Investigation of Rivers : Final Report, by Aubrey Strahan, Sc.D., LL.D., N. F. Mackenzie, M.Inst.C.Efl., H. R. Mill, D.Sc., LL.D., and J. S. Owens, M.D., A.M.Inst.C.E. Maps. Diagrams. London : Royal Geographical Society, 1916. (Price 3/6 net.) *Royal Geographical Society.
- The Geographical Teacher. The Organ of the Geographical Association. Nos. 44, 45, 46 ; 1916. *Mr. H. Sowerbutts, A.R.C.Sc.
- The Earliest Voyages Round the World, 1519—1617. Edited by P. F. Alexander, M.A. Maps and Illustrations. Cambridge : University Press, 1916. (Cambridge Travel Books.) Price, 3/- net. *The Syndics of the Cambridge University Press.
- The Fortnightly Review. Edited by W. L. Courtney. January—September, November, December, 1916. London : Chapman and Hall. *Miss K. Qualtrough, F.R.G.S.
- Almanack for the year 1916, by Joseph Whitaker, F.S.A., London.
- The Co-operative Wholesale Societies Limited, Annual, 1916. *Mr. G. H. Warren.
- The Incorporated Accountants' Year Book, 1916—17. *The Council of the Society of Incorporated Accountants and Auditors.

BRITISH ISLES.

- Handbook and Guide to Portsmouth. Prepared for the British Association, Portsmouth Meeting, 1911. Maps and Illustrations. Portsmouth, 1911 *(Mr. and Mrs. E. S. M. 3.)
- Notes on the Fenland, by Professor T. McKenny Hughes, M.A., F.R.S., etc. With a description of the Shippea Man, by Professor Alexander Macallister, M.A., F.R.S., etc. Sections and Illustrations. Cambridge : University Press, 1916. (Price, 6d. net.) *The Syndics of the Cambridge University Press.
- The Gravels of East Anglia, by Professor T. McKenny Hughes, M.A., F.R.S. Diagrams and Illustrations. Cambridge : University Press, 1916. (Price 1/- net.) *The Syndics of the Cambridge University Press.
- Warwickshire, by J. Harvey Bloom, M.A. Maps, Diagrams and Illustrations. (Cambridge County Handbooks.) Cambridge : University Press, 1916. (Price, 1/6 net.) *The Syndics of the Cambridge University Press.
- Manchester in 1915, being the Handbook for the 85th Meeting of the B.A.A.S., held in Manchester, September, 1915. University Press, 1915.

- Manchester Field Naturalists' and Archaeologists' Society. Report and Proceedings for the year 1915. *Mr. W. H. Ward.
- The Geology of the Lake District, and the Scenery as influenced by Geological Structure. By J. E. Marr, Sc.D., F.R.S. With Geological Map, other Maps and Illustrations. Cambridge: University Press, 1916. *The Publishers.
- The Story of Yorkshire. Map and Illustrations. London: Edward Arnold, 1895. *(Mr. and Mrs. E. S. M. 1.)
- A Handbook of York and District. Prepared for the 75th Meeting of the British Association for the Advancement of Science, 1906. Map and Illustrations. York, 1906. *(Mr. and Mrs. E. S. M. 2.)
- Upper Teesdale: Past and Present, by James Backhouse, F.L.S., etc. Map and Illustrations. London: Simpkin, Marshall and Co., 1896. *(Mr. and Mrs. E. S. M. 4.)
- Official Handbook to Newcastle and District. Edited by George B. Richardson and William Weaver Tomlinson for Visit of the British Association to Newcastle-upon-Tyne, 1916. Illustrated. Newcastle-upon-Tyne: Andrew Reid and Co., 1916.
- Reid's Handbook to Newcastle-upon-Tyne. Plan and Illustrations. Newcastle-upon-Tyne: Andrew Reid and Co., 1913.
- A Guide to Caerphilly Castle and the Neighbourhood. Plan and Illustrations. Cardiff: William Lewis, 1902. *(Mr. and Mrs. E. S. M. 5.)
- Handbook to the City of Dublin and the Surrounding District. Prepared for the Meeting of the British Association, September, 1908. Maps and Illustrations. Dublin, 1908. *(Mr. and Mrs. E. S. M. 6.)

EUROPE.

- Svenska Turistföreningens Arsskrift, 1916. Illustrated. Stockholm: Wahlstrom and Widstrand, 1916. *Svenska Turistföreningen (The Swedish Touring Club).
- An Appreciation of Russia. Illustrated. London: "Country Life," Autumn Number, 1916. *Miss K. Qualtrough, F.R.G.S.
- The "Times" Russian Supplement, Nos. 17—27. *Mr. Isaac Chorlton.
- La Science Française. Publiés par le Ministère de l'Instruction Publique, à l'occasion de l'Exposition de San Francisco, 1915. 2 Vols. *L'Office National des Universités et Ecoles Françaises.
- Vicente Añes Pinçon, by James Roxburgh McClymont, M.A. London: Bernard Quaritch, 1916. (Price, 10/6 net.) *The Author, per the Publisher.

ASIA.

- Twenty Years in Baghdad and Syria, By Canon J. T. Parfit, Chaplain of Jerusalem. (Reprinted from the "London Evening News.") London: Simpkin, Marshall and Co., Ltd., 1916.
- The German Road to Egypt by Harold J. Shepstone. Map and Illustrations. Manchester: The Millgate Monthly, Vol. XI, No. 126, March 1916.
- The Civilization of India, by Romesh C. Dutt. Maps and Illustrations. London: J. M. Dent, 1900. *(Mr. and Mrs. E. S. M. 7.)
- Peoples and Problems of India, by Sir T. W. Holderness, K.C.S.I. London: Williams and Norgate, 1911. *(Mr. and Mrs. E. S. M. 8.)

- The Verdict of India, by Sir Mancherjee M. Bhownagjee, K.C.I.E. London : Hodder and Stoughton, 1916. *East India Association.
- Punjab District Gazetteers. Vol. XXX A, Mianwali, 1915. *H.M. Secretary of State for India.
- Central Provinces District Gazetteers : Nimar. B. Volume. *H.M. Secretary of State for India.
- Central Provinces and Berar District Gazetteers. Addenda and Corrigenda to the B. Volumes of Buldana, Damoh, Jubbulpore, Hoshangabad. Yeotmal Districts, 1913-14. Akola, Bilaspur, Drug, Hoshangabad, Mandla, Narsinghpur, Raipur, Saugor, Seoni, 1914-15. *H.M. Secretary of State for India.
- Madras District Gazetteers. B. Vols. Anantapur, Anjengo, Bellary, Chingleput, Chittoor, Coimbatore, Guddapah, Godavari, Guntur, Kistna, Kurnool, Madura, Malabar, Nellore, Nilgiri, North Arcot, Ramnah, Salem, South Arcot, South Canara, Tanjore, Tinnevely, Trichinopoly, Vizagapatam. *H.M. Secretary of State for India.
- District Gazetteers of the United Provinces of Agra and Oudh. Supplementary Notes and Statistics to Vols. IX XV, XXI, XXXII, XXXIII, XLVII. *H.M. Secretary of State for India.
- Bengal District Gazetteers. B. Vols. (Statistics). Cuttack, Balasore, Puri, Santal Parganas, Purnea, Hazaribagh, Monghyr, Sambalpur, Angul. *H.M. Secretary of State for India.
- Assam District Gazetteers. Supplements to Vols. II, Sylhet. IV, Kamrup. V, Darrang. VI, Nowgong. VII, Sibsagar. VIII, Lakhimpur. X, The Khasi and Jaintia Hills, the Garo Hills and the Lushai Hills. *H.M. Secretary of State for India.
- Burma Gazetteers. A. Volumes. Bassein District. Ruby Minies District. *H.M. Secretary of State for India.
- China. Illustrated. Supplement to the "Manchester Guardian," April 18th, 1916.
- The Civilization of China, by H. A. Giles. London : Williams and Norgate, 1911. *(Mr. and Mrs. E. S. M. 9.)
- Illustrated Catalogue of an Exhibition of Chinese and Japanese Graphic and Applied Arts, lent by John Hilditch, M.R.A.S. Pottery, Porcelains, Glass, Paintings, Prints, Ivories, Lacquers, Swords, Armour, Bronzes of all periods from 3,000 years B.C. to 1906 A.D. Longford Park Museum, Stretford, 1914. Stretford : The Urban District Council of Stretford, Manchester, 1914. *Mr. John Hilditch, M.R.A.S., F.R.G.S.
- Manchuria : its People, Resources and Recent History, by Alexander Hosie, M.A., F.R.G.S. Map, Diagrams and Illustrations. London : Methuen and Co., 1901. *(Mr. and Mrs. E. S. M. 12.)
- Peace or War East of Baikal? by E. J. Harrison. Maps and Illustrations. Yokohama : Kelly and Walsh, Ltd., 1910. *(Mr. and Mrs. E. S. M. 11.)
- The Story of Korea, by Joseph H. Longford. Maps and Illustrations. London : T. Fisher Unwin, 1911.
- The Japanese Empire and its Economic Conditions, by Joseph d'Autremer. Map and Illustrations. London : T. Fisher Unwin, 1910. *(Mr. and Mrs. E. S. M. 10.)
- The "Times" Japanese Supplement, Nos. 2—6. *Mr. Isaac Chorlton.

AFRICA.

- The African Continent: A Narrative of Discovery and Adventure, by Hugh Murray, F.R.S.E. With an Account of Recent Exploring Expeditions, by Rev. John M. Wilson. Map and Illustrations. London: T. Nelson and Sons, 1853. *(Mr. and Mrs. E. S. M. 20.)
- The Opening up of Africa, by Sir H. H. Johnston, G.C.M.G. Maps. London: Williams and Norgate, 1911. *(Mr. and Mrs. E. S. M. 22.)
- The Life of Bruce, the African Traveller, by Major F. B. Head. Maps and Portrait. London: John Murray, 1830. *(Mr. and Mrs. E. S. M. 21.)
- The Life and Travels of Mungo Park, with supplementary details of the results of recent discovery in Africa. London: W. P. Nimmo, 1878. *(Mr. and Mrs. E. S. M. 23.)
- Sierra Leone Messenger. Illustrated. Nos. 93—96, 1916. *Rev. F. C. Smith, M.A., F.R.G.S.
- A Voice from the Congo, comprising Stories, Anecdotes, and Descriptive Notes, by Herbert Ward. Illustrations. London: Wm. Heinemann, 1910. *(Mr. and Mrs. E. S. M. 13.)
- Impressions of South Africa, by James Bryce. Third Edition. Maps. London: Macmillan and Co., Ltd., 1899. *(Mr. and Mrs. E. S. M. 14.)
- The New South Africa: its Value and Development, by W. Bleloch. Maps, Diagrams and Illustrations. London: Wm. Heinemann, 1901. *(Mr. and Mrs. E. S. M. 15.)
- The Right Honourable Cecil John Rhodes: A Monograph and a Reminiscence, by Sir Thomas E. Fuller, K.C.M.G. Portraits and Illustrations. London: Longmans, Green and Co., 1910. *(Mr. and Mrs. E. S. M. 16.)
- Cecil Rhodes: His Private Life, by his Private Secretary, Philip Jourdan. Illustrated. London: John Lane, 1911. *(Mr. and Mrs. E. S. M. 17.)
- The Guide to South and East Africa, for the use of Tourists, Sportsmen, Invalids and Settlers. Edited by A Samler Brown and G. Gordon Brown, F.R.G.S., for the Union Castle Mail Steamship Company, Ltd. Maps Plans and Diagrams. Twentieth Edition. London: Sampson Low, Marston and Co., 1914. *Union Castle Mail Steamship Co., per Mr. H. Sowerbutts, A.R.C.Sc.
- Some Early Exploring Expeditions and Travels in South Africa, by C. Graham Botha. Cape Town, 1916. *The Author.
- James Hannington, D.D., F.L.S., F.R.G.S. First Bishop of Eastern Equatorial Africa. A History of his Life and Work, by E. C. Dawson, M.A. 13th Thousand. Map and Illustrations. London: Seeley and Co., 1887. *(Mr. and Mrs. E. S. M. 24.)
- With a Prehistoric People: The Akikūyu of British East Africa, by W. S. Routledge, M.A., and Mrs. Katherine Routledge, M.A. Map and Illustrations. London: Edward Arnold, 1910. *(Mr. and Mrs. E. S. M. 18.)
- Glimpses of East Africa and Zanzibar, by Ethel Younghusband. Map and Illustrations. London: John Long, 1910. *(Mr. and Mrs. E. S. M. 19.)
- Wayfarer in the Libyan Desert, by Lady Evelyn Cobbold. Illustrated. London: Arthur L. Humphreys, 1912. *(Mr. and Mrs. E. S. M. 30.)

AMERICA.

- Canada, by A. G. Bradley. London : Williams and Norgate, 1911. *(Mr. and Mrs. E. S. M. 25.)
- The Physical Geography of Wisconsin, by Professor Lawrence, A.M., Ph.D. Maps and Illustrations. Madison : Wisconsin Geological and Natural History Survey, Bulletin XXXVI, 1916. *The Director of the Survey.
- Voyages and Discoveries of the Companions of Columbus, by Washington Irving. Map and Views. London : John Murray, 1831. *(Mr. and Mrs. E. S. M. 28.)
- The English in the West Indies or the Bow of Ulysses, by James Anthony Froude. Map and Illustrations. London : Longmans, Green and Co., 1888. *(Mr. and Mrs. E. S. M. 26.)
- The Island of Cuba : A Descriptive and Historical Account of the "Great Antilla," by Lieut. A. S. Rowan and M. M. Ramsey, B.S., A.M. Maps. London : Gay and Bird, 1898. *(Mr. and Mrs. E. S. M. 27.)
- Bolivia : the Heart of a Continent. A few facts about the Country and its Activities. Prepared for the Bolivian Legation. Washington, D.C., by William A. Reid. Map and Illustrations. Washington, 1916. *The Director, Pan-American Union.

OCEANIA.

- The Composition and Porosity of the intake beds of the Great Australian Artesian Basin, by E. F. Pittman, A.R.S.M., Government Geologist, N.S.W. Diagrams and Illustrations. Sydney : Department of Mines, Geological Survey of New South Wales, 1915. *The Author.

POLAR REGIONS.

- With the Shackleton Expedition. How I took the Shackleton Pictures, by Frank Hurley. Map and Illustrations. London : "The Sphere," Nos. 881 and 882, December 1916.

List of Corresponding Societies, etc. (Exchanges).

NOTE.—Exchanges with Societies marked "S." have been suspended from August 1st, 1914.

BRITISH.

- Belfast. Natural History and Philosophical Society. Report and Proceedings. (Nothing received.)
- Birmingham. Natural History and Philosophical Society. (Nothing received.)
- Cardiff. Naturalists' Society. Report and Transactions. (Not received.)
- Croydon. Natural History and Scientific Society. Proceedings and Transactions, 1915-1916.
- Edinburgh. The Royal Scottish Geographical Society. The Scottish Geographical Magazine, 1916, Vol. XXXII, Nos. 1-12 and Index.

- Glasgow. Geological Society. Transactions. Vol. XV, Part III.
- Glasgow. Royal Philosophical Society. Proceedings. (Nothing received.)
- Hertford. Hertfordshire Natural History Society and Field Club. Transactions. Vol. XVI, Part 2.
- Hull. Yorkshire Naturalists' Union. (Nothing received.)
- Leeds. Geological Association. Transactions. (Nothing received.)
- Leeds. Yorkshire Geological Society. Proceedings. (Nothing received.)
- Leicester. Literary and Philosophical Society. Transactions and Annual Report. (Nothing received.)
- Liverpool. Geographical Society. Transactions and Twenty-fourth Annual Report for the year 1915.
- London. The Anti-Slavery Reporter and Aborigines' Friend. 1916, Series V, Vol. V, No. 4; VI, 1, 2, 3.
- London. British Association for the Advancement of Science. Report of the Eighty-fifth Meeting, held in Manchester in 1915. Report of the Corresponding Societies' Committee and of the Conference of Delegates held in Manchester, 1915.
- London. Colliery Guardian, 1916, Nos. 2871-2922.
- London. The Colonial Journal. Vol. IX, 3, 4; X, 1, 2.
- London. The Royal Colonial Institute Journal. "United Empire." Vol. VII, Nos. 1-12.
- London. East India Association. Journal, 1916, Vol. VII, Nos. 1-4.
- London. Royal Geographical Society. The Geographical Journal, 1916, Jan. to Dec.
- London. Imperial Institute. Bulletin. Vol. XIV, Nos. 1-3.
- London. India office. (See List of Books.)
- London. Royal Botanic Gardens, Kew. Bulletin, 1916, Nos. 1-10 and Appendices I-IV.
- London. Royal Society of Literature. Transactions. Vol. XXXIV. Report and List of Fellows, 1916.
- London. The Near East, 1915, Nos. 244-295.
- London. War Office. Geographical Section, General Staff. (See List of Maps.)
- London. War Office. Catalogue of Maps. Accessions. (Nothing received.)
- London. War Office Library. Accessions, 1916, January to December. Catalogue of the War Office Library, Part III (Subject Index). Fourth Annual Supplement, 1915.
- Manchester. The British Cotton Growing Association. Publications. Nos. 61, 62.
- Manchester. Godlee Observatory. Report for the years 1913, 1914, and 1915.
- Manchester. Literary and Philosophical Society. Memoirs and Proceedings. Vol. 60, Parts I, II.
- Manchester. Museum. The University. Publications, Nos. 77, 78, 79.
- Manchester. The Textile Recorder, 1916, January to December.
- Newcastle-upon-Tyne. North of England Institute of Mining and Mechanical Engineers. Transactions. Vol. LXV, Parts 5, 7; LXVI, 1-7. Annual Report, 1915-1916.
- Oxford. Clarendon Press. (See List of Books.)

- Penzance. Royal Geological Society of Cornwall. Transactions. Vol. XV, Part 1.
- Rochdale. Literary and Scientific Society. (Nothing received.)
- Salford. Museum, Libraries and Parks Committee. Sixty-eighth Report, 1915-1916.
- York. Yorkshire Philosophical Society. Annual Report for 1915.

MISSIONARY.

- "S." Freiburg im Breisgau. Die Katholischen Missionen.
- London. Baptist Missionary Society. The Herald, 1916, January to Dec.
- London. The British and Foreign Bible Society. 112th Annual Report, 1916. "For the Healing of the Nations." A Popular Illustrated Report, 1915-1916. "The Bible in the World," 1916, January to December. Manchester and Salford Auxiliary, Annual Report, 1915.
- London. Church Missionary Society for Africa and the East. Report of Proceedings, 117th year, 1915-1916.
- London. Church Missionary Review, 1916, January to December.
- London. Colonial and Continental Church Society. Greater Britain Messenger, 1916, January to December.
- London. The London Missionary Society. (Nothing received.)
- London. Society for Propagation of the Gospel in Foreign Parts. Report of the year 1915.
- London. Universities' Mission to Central Africa. "Central Africa." 1916, January to December.
- London. The United Methodist Church. "Missionary Echo." 1916, Jan. to December.

COLONIAL.

- Adelaide. Royal Geographical Society of Australasia; South Australian Branch. Proceedings for the Session 1914-1915, Vol. XVI.
- Brisbane. Royal Geographical Society of Australasia. Queensland Branch. Queensland Geographical Journal. (Nothing received.)
- Brisbane. Queensland Museum. Memoirs. Vol. V.
- Brisbane. Department of Mines. Queensland Geological Survey. Publications, Nos. 240, 245, 247, 248, 249, 251, 252, 253, 254.
- Bulawayo. Rhodesia Scientific Association. Proceedings. (Nothing received.)
- Cape Town. Royal Society of South Africa. Transactions. Vol. V, Parts 3, 4, 5.
- Georgetown. The Royal Agricultural and Commercial Society of British Guiana. The Journal. "Timehri." (Nothing received.)
- Halifax. Nova Scotian Institute of Science. Proceedings and Transactions. Vol. XIV, Parts, 1, 2, 1914-1915.
- Melbourne. Royal Geographical Society of Australasia (Victorian Branch). Victorian Geographical Journal. Vol. XXXII, Part 1, 1916.
- Melbourne. Victorian Statistical Department. Nothing received.)
- Perth. Western Australia Geological Survey (per favour of the Agent-General). Bulletins, No. 64.
- Port Moresby. Papua. Annual Report for the year 1914-1915.
- Quebec. Société de Géographie. Bulletin. Vol. X, Nos. 1-5, 1916.

- Sydney. New South Wales. Department of Mines. Annual Report for the year 1915.
- Sydney. New South Wales. Department of Mines. Geological Survey. Mineral Resources. Nos. 20-23.
- Toronto. Canadian Institute. Transactions. No. 25, Vol. XI, Part 1, Nov., 1915.
- Victoria, B.C. Minister of Mines. Province of British Columbia. Annual Report, 1915.
- Wellington, New Zealand. Department of Lands and Survey. Report of the Department, 1914-15; Report on the Survey Operations, 1914-15; Report on State Nurseries and Plantations, 1914-15; Report on Scenery Preservation, 1914-15.

FOREIGN.

- Alger. Société de Géographie d'Alger et de L'Afrique du Nord. Bulletin. (Nothing received.)
- Ann Arbor. The Michigan Academy of Science. University of Michigan. 16th Report, 1914.
- "S." Antwerp. Société Royale de Géographie d'Anvers. Bulletin.
- Baltimore. Johns Hopkins University. Studies in Historical and Political Science. Series XXXIII, No. 4; XXXIV, 1. Circulars, 1915, Nos. 6-10.
- Baltimore. Maryland Geological Survey. (Nothing received.)
- Barcelona. Sociedad de Geografia Comercial. Publicaciones. (Nothing received.)
- "S." Belgrade. Société Serbe de Géographie. Bulletin.
- Berkeley. University of California. Publications in Geography. Vol. I, Nos. 8, 9 Publications in American Archaeology and Ethnology. Vol. XI, Nos. 5, 6, 7; XII, 1.
- "S." Berlin. Gesellschaft für Erdkunde. Zeitschrift.
- "S." Berlin. Deutsche Kolonialzeitung.
- Bern Geographische Gesellschaft. (Nothing received.)
- Bordeaux. Société de Géographie Commerciale. Revue. (Nothing received.)
- "S." Bremen. Deutsche Geographische Blätter.
- "S." Brussels. Congo Belge. Bulletin Official.
- "S." Brussels. Société Royale Belge de Géographie.
- "S." Brussels. Le Mouvement Géographique.
- "S." Brussels. Institut Colonial International.
- "S." Brussels. Société Belge d'Etudes Coloniales. Bulletin.
- "S." Budapest. Hungarian Geographical Society. Bulletin.
- Buenos Aires. Instituto Geográfico Argentino. Boletín. (Nothing received.)
- Buenos Aires. Museo Nacional de Historia Natural de Buenos Aires. Anales. (Nothing received.)
- Buenos Aires. Monthly Bulletin of Municipal Statistics. 1915, Nos. 9-12; 1916, 1-8.
- Buenos Aires. Ministerio de Agricultura de la Nacion. Boletín. Tomo XX, Nos. 5 y 6.
- Cairo. Société Khédiviale de Géographie. Bulletin. (Nothing received.)
- Cambridge. Peabody Museum of American Archaeology and Ethnology. Harvard University. 49th Report, 1914-1915.

- "S." Cassel. Gesellschaft für Erd-und Völkerkunde.
 Christiania. Norges Geografiske Opmaalng. (See List of Maps.)
 Copenhagen. Geografisk Tidsskrift udgivet af Bestyrelsen for det Kongelige Danske Geografiske Selskab. Bind XXIII, Hefte 5-7.
 "S." Darmstadt. Verein für Erdkunde.
 Dijon. Société Bourguignonne de Géographie et d'Histoire. Mémoires.
 (Nothing received.)
 "S." Douai. Union Géographique du Nord de la France. Bulletin.
 "S." Dresden. Verein für Erdkunde. Mitteilungen.
 Dunkerque. Société de Géographie. Bulletin. (Nothing received.)
 Firenze (Florence). Rivista Geografica Italiana e Bollettino della Società di Studi Geografici e Coloniali. Annata XXIII, Fasci. 1-10.
 "S." Frankfurt. Verein für Geographie und Statistik.
 Geneva. "Le Globe." Organe de la Société de Géographie. Bulletin. Tome LV. Mémoires. Tome LV.
 Geneva. Société des Anciens Elèves de l'Ecole Supérieure de Commerce. Bulletin. Nos. 109-112.
 "S." Giessen. Geographische Mitteilungen aus Hessen.
 "S." Greifswald. Geographische Gesellschaft zu Greifswald. Jahresbericht.
 "S." Halle. Sächsisch-Thüringischen Vereins für Erdkunde.
 "S." Halle. Kaiserliche Leopoldinisch-Carolinische Deutsche Akademie der Naturforscher. Leopoldina.
 "S." Hamburg. Geographische Gesellschaft. Mitteilungen.
 "S." Hamburg. Hauptstation für Erdbebenforschung. Professor Dr. R. Schütt.
 "S." Hannover. Geographische Gesellschaft.
 Havre. Société de Géographie Commerciale. Bulletin. (Nothing received.)
 Havre. Société Géologique de Normandie. Bulletin. (Nothing received.)
 Helsingfors. Société de Géographie de Finlande. Fennia. (Nothing received.)
 Helsingfors. Meddelanden af Geografiska Foreningen. Velenskagliga.
 (Nothing received.)
 Irkutsk. Imperial Russian Geographical Society. East Siberian Section. Journal. (Nothing received.)
 "S." Jena. Geographische Gesellschaft. Mitteilungen.
 Kazan. Naturalists' Society of the Imperial University. Journal. (Nothing received.)
 La Paz. Sociedad Geografica de La Paz. (Nothing received.)
 La Paz. Republica de Bolivia. Direccion General de Estadistica y Estudios Geográficos. Boletin. (Nothing received.)
 La Plata. Direccion General de Estadistica de la Provincia de Buenos Aires. Boletin Mensual. (Nothing received.)
 La Plata. Museo de La Plata. Revista. (Nothing received.)
 "S." Leipzig. Gesellschaft für Erdkunde.
 "S." Lille. Société de Géographie. Bulletin.
 Lima. Sociedad Geográfica. Boletin. (Nothing received.)
 Lima. Cuerpo de Ingenieros de Minas del Peru. Boletin. Nos. 55, 82.
 Lisbon. Sociedade de Geographia de Lisboa. Boletim. 1915, Nos. 11-12; 1916, 1-6.
 "S." Lübeck. Geographische Gesellschaft und Naturhistorische Museum.

- Madison. Wisconsin Academy of Science, Arts and Letters. Transactions. Vol. XVIII, Part 1.
- Madison. Wisconsin Geological and Natural History Survey. Bulletin. Nos. XXVII-XXXII (with Maps), XXXV, XXXVI XXXVII-XL (with Maps), XLIV.
- Madrid. Real Sociedad Geografica. Boletín. Tomo LVIII, Trims. 1-3. Revista. Tomo XIII, 1-12. Cuadragésimo Aniversario, 1876-1916. Junta General y Pública, 27 de Marzo de 1916.
- Madrid. Ayuntamiento de Madrid. Boletín, Nos. 992-1043.
- Marseille. Société de Géographie. Bulletin. Tome XXXIX, Nos. 1-4.
- "S." Metz. Verein für Erdkunde. Jahresbericht.
- Mexico. Sociedad Mexicana de Geografía y Estadística. Boletín. (Nothing received.)
- Mexico. Sociedad Científica "Antonio Alzate." Memorias y Revista. Tomo XXXII, Nos. 11-12; XXXIII, 11-12; XXXIV, 1-10.
- Milan. L'Esplorazione Commerciale. Anno XXXI. Fascs. 1-12.
- Missoula. University of Montana. Bulletin. (Nothing received.)
- Montevideo. Museo de Historia Natural. (Nothing received.)
- Montevideo. Anuario Estadístico de la República Oriental del Uruguay. (Nothing received.)
- Montpellier. Société Languedocienne de Géographie. Bulletin. Tome XXXVIII, 4; XXXIX, 1.
- Moscow. Geographical Section of the Imperial Society of Natural Science of the University. (Nothing received.)
- "S." Munich. Geographische Gesellschaft in München. Mitteilungen.
- Nancy. Société de Géographie de L'Est. Bulletin. (Nothing received.)
- Nantes. Société de Géographie Commerciale. Bulletin. (Nothing received.)
- Naples. Società Africana d'Italia. "L'Africa Italiana." Anno XXXIV, 10; XXXV, 5-8.
- Neuchâtel. Société Neuchâteloise de Géographie. Bulletin. Tome XXV.
- New Haven. Connecticut Academy of Arts and Sciences. Memoirs. Vol. IV, July, 1916; V, May, 1916.
- New York. American Geographical Society. The Geographical Review. 1916, January to December.
- New York. American Museum of Natural History. Bulletin. Vol. XXXIV, 1915. Memoirs. Vol. I, Part VI.
- New York. Public Library. Bulletin. 1916, January—December.
- Novara. Instituto Geografico de Agostini. "La Geografia." Anno IV, Nos. 2-10. (See List of Maps.)
- "S." Nürnberg. Naturhistorische Gesellschaft.
- Odessa. Club Alpin de Crimée et du Caucase. Bulletin. 1915, Nos. 3-4.
- Omsk. Imperial Russian Geographical Society. West Siberian Branch. (Nothing received.)
- Oran. Société de Géographie et d'Archéologie. Bulletin. Tome XXXV, Fascs. 143; XXXVI, 144, 145, 146.
- Para. Museu Goeldi. Boletín. (Nothing received.)
- Paris. Société de Géographie. La Géographie. 1915, November, December.
- Paris. Société de Géographie Commerciale. Bulletin. 1916, January to September.

- Paris. Société de Spéléologie. Bulletin and Mémoires. Spelunca. (Nothing received.)
- Paris. Société de Topographie de France. Bulletin Bimestriel. (Nothing received.)
- Paris. Comité de L'Afrique Française et du Comité du Maroc. Bulletin. 1916, Nos. 1-12. Renseignements Coloniaux. 1916, Nos. 1-12.
- Petrograd. Imperial Russian Geographical Society. Journal. Vol. XLIX, Nos. 4-6; L, 1-9; LI, 1-10; LII 1-3.
- Philadelphia. American Philosophical Society. Proceedings. Vol. LIV, No. 220; LV, 1-7.
- Philadelphia. The Commercial Museum. "Commercial America." 1916, January to December.
- Philadelphia. Geographical Society of Philadelphia. Bulletin. 1916, Nos. 1-4.
- Philadelphia. University of Philadelphia. The Museum Journal. Vol. VI, Nos. 3, 4; VII, 1, 2, 3.
- "S." Prague. Société de Géographie tchéque à Prague.
- Rochefort. Société de Géographie. Bulletin. (Nothing received.)
- Rolla, Mo. Missouri Bureau of Geology and Mines. (Nothing received.)
- Roma. Reale Società Geografica. Bollettino. 1916, Nos. 1-12.
- Roma. Direzione Generale della Statistica e del Lavoro. Annuario Statistico Italiano. (Nothing received.)
- Roma. Commissariato dell' Emigrazione. Bollettino. 1916, Nos. 1-9.
- Roma. Cosmos. Del Profr. Guido Cora. (Nothing received.)
- Rome. International Institute of Agriculture. Monthly Bulletin of Agricultural Intelligence and Plant Diseases. 1916, Nos. 1-9.
- Rouen. Société Normande de Géographie. Bulletin. (Nothing received.)
- San Francisco. Geographical Society of the Pacific. (Nothing received.)
- San José. Museo Nacional. Boletín de Fomento, organo del Ministerio de Fomento. (Nothing received.)
- St. Louis, M. Washington University Studies. Vol. III, Part I, No. 1; III, Part II, Nos. 1-2; IV, Part I, No. 1.
- St. Nazaire. Société de Géographie Commerciale. (Nothing received.)
- San Salvador. Direccion General de Estadistica. (Nothing received.)
- Shanghai. Chinese Maritime Customs. Gazette. Statistical Series. Nos. 3 and 4. Returns of Trade and Trade Reports. 1914, Part II, Vols. 4, 5; III, Vol. 2. 1915, Parts I; II, Vols. 1-4; III, Vols. 1-2.
- Shanghai. Ministry of Communications. Directorate General of Posts. II. Public Series: No. 2. Report on the Working of the Chinese Post Office for 1915.
- "S." Stettin. Gesellschaft für Völker-u-Erdkunde.
- Stockholm. Svenska Sällskapet för Antropologi och Geografi. "Ymer," 1916. Häft 1-3.
- "S." Strassburg. Gesellschaft für Erdkunde und Kolonialwesen.
- "S." Stuttgart. Württembergische Vereins für Handelsgeographie.
- Tokyo. Geographical Society. Journal of Geography. (Nothing received.)
- Toulouse. Société de Géographie. Bulletin. 1915, Nos. 2, 3, 4.
- Tours. Société de Géographie. Revue. (Nothing received.)

- Upsala. University of Upsala. Geological Institution. Bulletin. (Nothing received.)
- Urbana. Illinois State Geological Survey. Bulletins, Nos. 11, 24, 26. Illinois Coal Mining Investigations, Co-operative Agreement. Bulletin. Nos. 9, 12, 13, 14.
- "S." Vienna. K.K. Geographische Gesellschaft. Mitteilungen.
- "S." Vienna. Verein der Geographen an der K.K. Universität in Wien.
- "S." Vienna. K.K. Naturhistorische Hofmuseum. Annalen.
- Washington, Conn. Association of American Geographers. Annals. Vol. IV, 1914; V, 1915.
- Washington, D.C. National Geographic Society. National Geographic Magazine. 1916, Vol. XXIX, Nos. 1-6; XXX, 1-6.
- Washington, D.C. Department of Commerce, United States Coast and Geodetic Survey. Annual Report to June, 1915. Serials Nos. 19, 21, 23, 27, 33. "Geodesy" Special Publication. Nos. 27, 30, 31, 35. "Terrestrial Magnetism" Special Publication. Nos. 25, 33, 36.
- Washington, D.C. United States Department of the Interior. Annual Report to June, 1915. Glimpses of our National Parks, 1915 and 1916. Proceedings of the National Park Conference, Berkeley, California, 1915. General Information regarding Crater Lake, Glacier, Mesa Verde, Mount Rainier, Sequoia and General Grant, Yellowstone, and Rocky Mountain National Parks; Season of 1916. Forests of Crater Lake, Mount Rainier, Yosemite, Sequoia and General Grant National Parks. Features of the Flora of Mount Rainier National Park.
- Washington, D.C. U.S. Geological Survey. 36th Annual Report, to June, 1915.
- Washington, D.C. U.S. Geological Survey. Monograph. (None received.)
- Washington, D.C. U.S. Geological Survey. Mineral Resources for the year 1914, Part 1, Nos. 10-26; Part 2, Nos. 21-34. 1915, Part 1, Nos. 1, 2; Part 2, Nos. 1-11.
- Washington, D.C. U.S. Geological Survey. Bulletin. Nos. 603-620 (A-P), 621 (A-P), 622, 623, 626, 628, 629, 632, 633, 634.
- Washington, D.C. U.S. Geological Survey. Professional Papers. Nos. 89, 95 E-J, 98 A-H.
- Washington D.C. U.S. Geological Survey. Water Supply Papers. Nos. 332, 351, 352, 355, 359, 369, 370, 372-375 (A-G), 376-379, 383, 385, 388.
- Washington, D.C. U.S. National Museum. Report for the year ending June 30, 1915.
- Washington, D.C. U.S. Geographic Board. 4th Report, 1890-1916.
- Washington, D.C. U.S. Department of Agriculture. Farmers' Bulletins, Nos. 700-710, 712, 714, 717.
- Washington, D.C. U.S. War Department. (Nothing received.)
- Washington, D.C. U.S. Bureau of Education. Report of the Commissioner for the year ending June 30, 1915. Vol. 1.
- Washington, D.C. Library of Congress. Annual Report, 1915.
- Washington, D.C. Pan American Union. Bulletin. 1916, January to Dec.
- Washington, D.C. Carnegie Institution. Department of Terrestrial Magnetism. Annual Report for 1915.
- Zürich. Geographisch-Ethnographische Gesellschaft in Zürich.

List of Members.

DECEMBER 31st, 1916.

Note.—H signifies Honorary, C—Corresponding, L—Life, A—Associate,
* Affiliated Societies. All others are Ordinary Members.

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| Abbott, F. S., F.C.A. | ^Beck, H. S. |
| Adnett, Madame M. | Beer, Walter |
| L^Ainsworth, John, C.M.G., F.R.G.S. | Behrens, Councillor Sir Charles, J.P. |
| (Kisumu) | Behrens, Gustav, J.P. |
| Alexander, W. T., J.P. | cBellamy, C. H., F.R.G.S., Tourcoing |
| ^Allen, Mrs. James | ^Bellamy, Reginald C., A.C.A. |
| H^Amundsen, Captain Roald | Bennett, Miss Ruth |
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Rules.

I. OBJECT AND WORK.

The object of the Manchester Geographical Society is to promote the study of all branches of Geographical Science, especially in its relations to commerce and civilisation.

The work of the Society shall be :—

1. To further in every way the pursuit of the science; as, by the study of official and scientific documents, by communications with learned, industrial and commercial societies, by correspondence with consuls, men of science, explorers, missionaries, and travellers, and by the encouragement of the teaching of geography in schools and colleges.

2. To hold meetings at which papers shall be read, or lectures delivered by members or others.

3. To examine the possibility of opening new markets to commerce and to collect information as to the number, character, needs, natural products and resources of such populations as have not yet been brought into relation with British commerce and industry.

4. To promote and encourage, in such way as may be found expedient, either alone or in conjunction with other Societies, the exploration of the less known regions of the earth.

5. To inquire into all questions relating to British and Foreign colonisation and emigration.

6. To publish a Journal of the proceedings of the Society, with a summary of geographical information.

7. To form a collection of maps, charts, geographical works of reference, and specimens of raw materials and commercial products.

8. The Society shall not enter into any financial transactions beyond those necessarily attached to its declared object, and shall not make any dividend, gift, division, or bonus in money unto or between any of its members.

II. ORGANISATION.

9. The Society shall consist of ordinary, associate, corresponding, and honorary members.

10. A Council shall be chosen annually from the ordinary members to conduct the affairs of the Society. It shall consist of a President, four or more Vice-Presidents, a Treasurer, two or more Honorary Secretaries (including a Secretary for Foreign Correspondence), and twenty-one Councillors.

11. There shall be three Trustees elected by the Society, who shall hold office until death, disability, insolvency or resignation. They shall be members of the Council by virtue of their office.

12. Any vacancy occurring in the Council during the current year may be filled up by the Council.

III. ELECTION OF MEMBERS.

13. Every candidate for admission into the Society as an ordinary or an associate member must be proposed by a member. The proposal shall be read out at the next Ordinary Meeting of the members, and any objection shall be forwarded in writing to the Secretary within seven days.

14. The election of members is entrusted to the Council. The names of those elected shall be announced from the chair at the next Ordinary Meeting after the election.

15. The Secretary shall within three days forward to every newly-elected member notice of his election, a copy of the Rules of the Society, and a card

announcing the days on which the Ordinary Meetings will be held during the session. But the election of an ordinary or associate member shall not be complete, nor shall he be permitted to enjoy the privileges of a member, until he shall have paid his first year's subscription. Unless such a payment be made within three calendar months from the date of election the election shall be void.

16. The Council shall have power to elect honorary and corresponding members.

17. Women shall be eligible as members and officers of the Society.

IV. PAYMENTS.

18. An ordinary member shall pay an annual subscription of £1. 1s., or he may compound by one payment of £10. 10s. An associate member shall pay an annual subscription of 10s. 6d. The Society's year shall begin on the first day of January.

19. Members shall not be entitled to vote or to enjoy any other privilege of the Society so long as their payment shall continue in arrear, but associate members shall not vote nor shall they take any part in the government of the Society.

20. The first annual payment of a member elected in November or December shall cover his subscription to the 31st of December in the year following.

21. On the first day of January in each year there shall be put up in the rooms of the Society a complete list of the members with the amount of their subscription due, and as the amounts are paid the fact shall be marked on the list.

22. Notice shall be sent to every member whose subscription shall not have been paid by the first of February, and if the arrears are not discharged by the first of July the Council may remove the member from the list of members. Any member, whose subscription is in arrear for two years shall not be entitled to receive the Journal of the Society.

V. MEETINGS.

23. The meetings of the Society shall be of three kinds—Ordinary, Annual, and Special.

24. In all meetings a majority of those present shall decide on all questions, the President or Chairman having a casting vote in addition to his own.

ORDINARY MEETINGS.

25. The Ordinary Meetings of the Society shall be held once a month, from the month of October to the month of May, or oftener, if judged expedient by the Council.

26. All members whose subscriptions are not in arrear shall have a right to be present. All ordinary members shall have the privilege of introducing one visitor.

27. The order of the proceedings shall be as follows :—

(a) The minutes of the last meeting to be read and if correctly recorded they shall be signed by the Chairman.

(b) Presents, whether of money, books, maps, charts, instruments or specimens, made to the Society to be announced.

(c) The election of new members to be declared and the names of candidates to be read.

(d) Papers and communications to be read and discussed.

28. At these meetings nothing relating to the rules or management shall be brought forward, but the minute book of the Council shall be on the table at each meeting for the inspection of any member, and extracts therefrom may,

with the consent of the chairman, be read to the meeting on the requisition of any member.

23. On occasions of exceptional interest the Council may make provision for a larger admission of visitors.

ANNUAL MEETINGS.

30. The Annual Meeting of the members shall be held at such time and place as the Council may determine.

31. Fourteen days' Notice of such meeting shall be sent to every member within the United Kingdom who has given his address to the Secretary, and notice of the meeting shall be advertised in such newspapers as the Council may direct.

32. The object of this meeting shall be to receive the Annual Report of the Council and the Treasurer's Balance Sheet, to hear the President's address, to elect the Council and officers for the ensuing year, and to transact any other business.

33. Any two ordinary members may nominate candidates for the Council or for office not later than one week prior to the day of election, and the names of candidates so nominated shall be at once put up in the rooms of the Society. The election of the Council and officers shall be by ballot.

SPECIAL GENERAL MEETINGS.

34. The Council may call a Special General Meeting of the Society whenever they shall consider it necessary, and they shall do so if required by 20 ordinary members.

35. A week's notice of the time and object of every Special Meeting shall be sent to all members. No other business shall be entertained than that of which notice has been thus given.

36. Twenty ordinary members shall form a quorum.

VI. COUNCIL AND OFFICERS.

THE COUNCIL.

37. The government of the Society shall be entrusted to the Council, subject to the rules of the Society.

38. The Council shall annually elect a Chairman and Vice-Chairman.

39. The President or the Chairman, or any three members of the Council, may at any time call a meeting thereof, to which every member of the Council shall be summoned.

40. Seven shall form a quorum.

41. In order to secure the most efficient study and treatment of the various subjects which constitute the chief work of the Society, the Council may appoint Committees for special purposes. These Committees, with the approbation of the Council, may associate with themselves any persons—whether members of the Society or not—from whom they may desire to obtain special assistance or information. The Committees shall report to the Council the results of their proceedings.

42. The President, Chairman, Vice-Chairman of the Council, and the Honorary Secretaries, shall, by virtue of their offices, be members of all Committees appointed by the Council.

PRESIDENT AND VICE-PRESIDENTS.

43. The President, is, by virtue of his office, the chairman of all the meetings of the Society. In the absence of the President, one of the Vice-Presidents may preside.

CHAIRMAN OF THE COUNCIL.

44. It is the duty of the Chairman of the Council to see that the rules are

properly observed, to call for reports and accounts from Committees and Officers, and to summon, when necessary, special meetings of the Council and of Committees.

TREASURER.

45. The Treasurer has the charge of all accounts; he shall pay all accounts due by the Society after they have been examined and approved by the Council.

46. He shall see that all moneys due to the Society are collected, and shall have power, with the approval of the Council, to appoint a Collector. All moneys received shall be immediately paid to the bankers of the Society.

47. The bank passbook and the book of accounts shall be laid upon the table at every ordinary meeting of the Council.

48. The accounts shall be audited annually by two members, who shall be elected at an ordinary meeting at least one month before the Annual Meeting.

SECRETARIES.

49. The duties of the Honorary Secretaries shall be :—

- (a) To conduct the correspondence of the Society and of the Council.
- (b) To attend the meetings of the members and of the Council, and minute their proceedings.
- (c) At the ordinary meetings, to announce gifts presented to the Society since their last meeting; to read the names of all new members and of candidates for admission, and the papers communicated to the Society, which have been directed by the Council to be read.
- (d) To have immediate superintendence of all persons employed, to make arrangements for the meetings of the Society, and to take charge of all maps, books, furniture and other effects.

50. It shall be the more especial duty of one of the Honorary Secretaries to conduct, as may be directed by the Council, correspondence with Foreign Societies, and with persons resident abroad.

51. In addition to the Honorary Secretaries, there shall be a paid Secretary appointed by the Council, whose duties shall be to assist the Honorary Secretaries, to issue the notices of the Council and of the Society, and to act under the instructions of the Council.

The foregoing Rules, as now amended, were approved and adopted at a meeting of the members of the Society, of which due notice had been given to the members, held in the Town Hall, Manchester, Wednesday, October 3rd, 1894.

(Signed) GEORGE, President.

S. ALFRED STEINTHAL, Chairman

F ZIMMERN, Honorary Secretary.

JAS. D. WILDE, M.A., Honorary Secretary.

ELI SOWERBUTTS, Secretary.

[Copy.]

It is hereby certified that this Society is entitled to the benefit of the Act 6 and 7 Vict., Cap. 36, intituled "An Act to exempt from County, Borough, Parochial, and other Local Rates, Lands and Buildings, occupied by Scientific or Literary Societies."

Seal of Registry of
Friendly Societies.

This 15th day of January, 1895.

E. W. B.

THE
JOURNAL
OF THE
MANCHESTER GEOGRAPHICAL
SOCIETY



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1917

THE
COUNCIL AND OFFICERS
OF THE
MANCHESTER GEOGRAPHICAL SOCIETY
FOR 1917.

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HIS MAJESTY THE KING.

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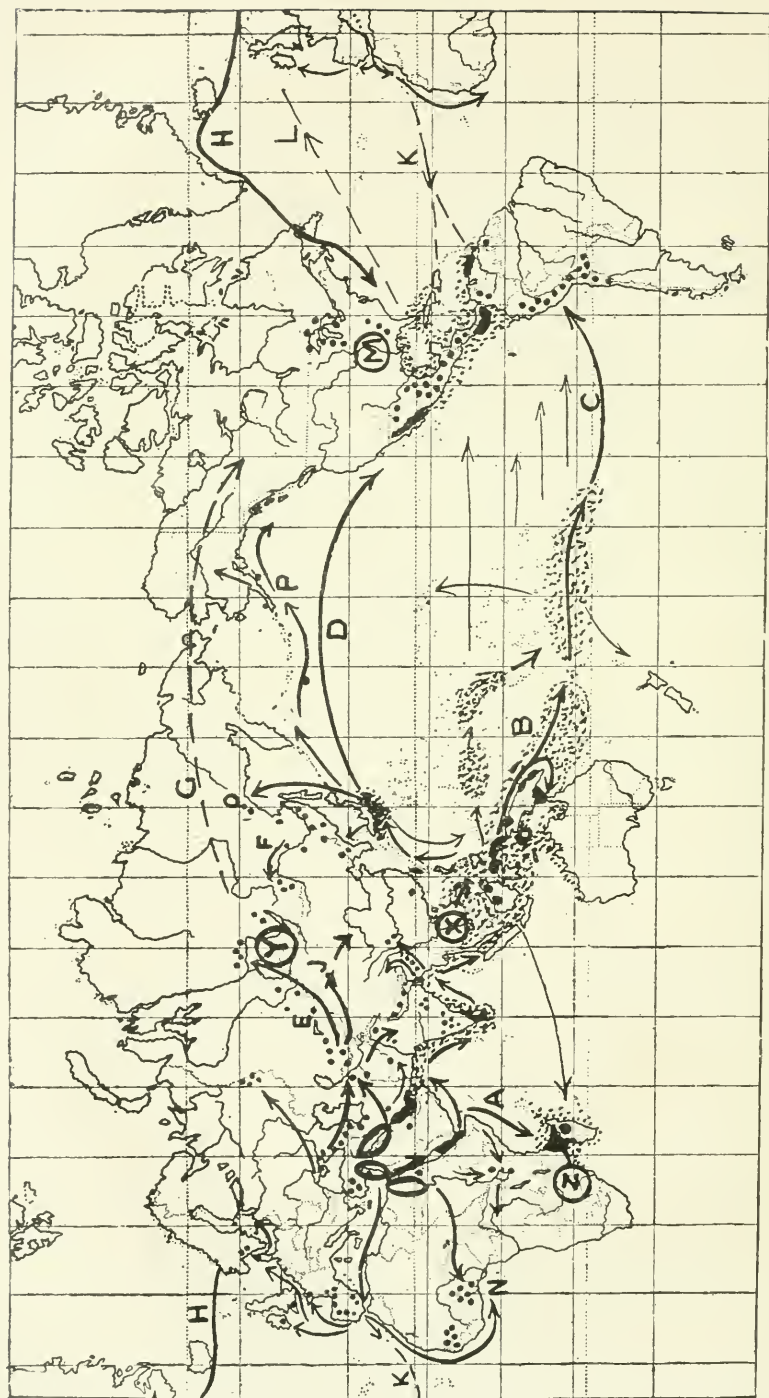
SPECIAL NOTE :—

The List of Members and the Rules have not been included in this Volume for reasons of economy.

Names of New Members and of Members lost by death will be found in the Proceedings.

THE WRITERS OF THE PAPERS ARE ALONE RESPONSIBLE FOR
THEIR OPINIONS.

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MAP OF EARLY SEA AND LAND ROUTES.
 (For Explanation, see end of Paper on "Ancient Mariners.")

The Journal

OF THE

Manchester Geographical Society.

* * *

ANCIENT MARINERS.

By Professor G. ELLIOT SMITH, F.R.S.

(Addressed to the Society in the Geographical Hall on Tuesday, January 23rd, 1917.)

At the close of the fifteenth century Vasco da Gama realized the dream of Prince Henry the Navigator. He was the first captain from Western Europe to take his ships around the Cape into the Indian Ocean.¹

What was virtually a new world was thus revealed to the peoples of the West. For the recollection of the earlier Oriental enterprises of the sailors of the Eastern Mediterranean had become dimmed in the mists of the distant past; and the commercial intercourse with Asia had passed almost entirely into the hands of intermediaries. Asiatic caravans brought the produce of the Orient to Syria and Alexandria, and Venetian merchants distributed it along the coasts of Europe. The fanciful tales brought back by the rare European adventurers who penetrated far into Asia only served to enhance the mystery in which it had become veiled.

Thus the intrusion of the Portuguese into the Indian Ocean was really the opening up of a new world to the people of Europe.

Great, therefore, was the surprise of Vasco da Gama, when he entered this new and mysterious domain in the year 1498, to find at Mozambique four ocean-going ships manned by Arabs. In spite of their obvious superficial differences in appearance, these ships were planned and built on essentially the same lines as those which the great Portuguese sailor himself had brought into Mozambique, and, although for many

1. Two years earlier Bartholomew Diaz had rounded the Cape, but without realising that he had done so.

centuries there had been little if any communication between the respective groups of ship builders, the arbitrary nature of the essential plan of construction of these Portuguese and Arabic ships would have revealed, to anyone who had cared to investigate the matter, that in the distant past these structural designs must have been derived from a common source.

But even more surprising than the similarity of their methods of ship-building was the identity of the aims of the two fleets. For the ships of the Arabs were laden with gold and silver, spices, precious stones and pearls; and these were the things for which the Portuguese were searching, the allurements which had led them to brave the dangers of unknown seas, and embark upon the most hazardous of enterprises.

The link between these European and Arabic methods and motives will be found if we throw our minds back to a time fourteen centuries before Vasco da Gama. The "*Periplus of the Erythræan Sea*," written by some unknown Greek sailor for a few years after the middle of the First Century, describes the details of the maritime trafficking at the beginning of the Christian era.¹

These seamen exploited the coasts, not only of the Mediterranean and Atlantic, but also of the Red Sea and Indian Ocean—the Azanian region of East Africa, Arabia, the Persian Gulf, India and Ceylon. They themselves, or other sailors with whom they came into close trading relations, went further east—to Burma, the Malay Peninsula, Indonesia, Cambodia and China.²

Their ships and their motives for maritime trafficking were the models both of the Portuguese and the Arabs fourteen centuries later.

But such maritime exploits were by no means novel adventures even in the First Century. On the walls of the famous temple of the Egyptian Queen Hatshepsut at Thebes there is preserved to this day a remarkable series of bas-reliefs depicting all the incidents of an expedition by sea from Egypt to East Africa, which took place as long before the time of the

1. "*The Periplus of the Erythræan Sea, Travel and Trade in the Indian Ocean, by a Merchant of the First Century*," translated from the Greek and annotated by Wilfred H. Schoff, New York, 1912.

2. For a detailed study of the early routes in the Far East see G. E. Gerini's "*Researches on Ptolemy's Geography of Eastern Asia*," Asiatic Society Monographs, No. 1, 1909.

"Periplus" as the latter was before that of Vasco da Gama. We find the prototypes of the great ocean-going ships, engaged in the same sort of traffic for gold, precious woods, incense, spices and slaves. But Egyptian literature has preserved the evidence that these maritime expeditions, not merely in the Red Sea but also in the Mediterranean, were well established even in the Pyramid Age, fourteen centuries before Queen Hatshepsut's time!

Although at a very early period in the history of mankind logs and floats of various kinds were used by many peoples to cross narrow sheets of water or for paddling along coast-lines, the real history of boat-building began¹ when the earliest dwellers on the banks of the Nile tied together bundles of reeds to make floats. These simple craft not only determined the form of the wooden ships that succeeded them, but the methods of construction which were required for making the reed floats, *i.e.*, tying them together with cords, were also adopted when wooden ships came to be built by adding planks to the hollowed out log which eventually degenerated into the mere keel of the composite ship. Thus the earliest Egyptian term for ship-building was the word signifying "to bind" (Breasted, p. 176).

When other methods were devised and the component parts of the larger vessels were fixed together with wooden or metal pegs, the older procedures were not abandoned. Even at the present time we still find upon the Nile all these primitive types which are survivals of phases in the history of ship-building, some of them more than sixty centuries old.

In the course of later ages, when more venturesome sailors using large merchantmen, which were the latest creations of the shipbuilder's skill and ingenuity, were able to make their way to the East, and wander, stage by stage, as far as the Pacific Coasts of America, they took with them not only the large vessels in which they actually made their journeys, but also the recollection of all these more primitive types of vessels which were still in use in their homeland. Thus we still find scattered in certain localities along the whole route from the Red Sea to America a great variety of primitive vessels, reed-floats, the double canoe, the catamaran, "sewed

1. See my essay on "Ships as Evidence of the Migration of Early Culture"; also J. H. Breasted, "The Earliest Boats on the Nile," *The Journal of Egyptian Archaeology*, Vol. IV, 1917, p. 174.

boats," rib-less boats, and many other primitive kinds of ships, the prototypes of which were being used upon the Nile long before the Pyramids were built.

In my article on "Ships as Evidence of the Migration of Early Culture," I have given some of the facts in substantiation of this claim; and since then Professor Breasted (*Op. cit. supra*), who apparently was not acquainted with, or rather does not refer to, my essay, has added important corroboration.

In some of the tombs and temples of the Old Egyptian Kingdom we find pictures, carved almost fifty centuries ago, depicting the earliest known sea-going ships and the methods of their construction.

In the essay on "Ships as Evidence of the Migration of Early Culture" ¹ I have discussed the significance of the facts revealed by the methods of early boat-building. On the present occasion I am concerned more especially with the study of the influence exerted by maritime intercourse in the history of civilization.

Egypt has preserved literary records in substantiation of the fact that, as early as the time of the Third Dynasty, expeditions by sea were being equipped to obtain the incense, resins, and wood required for the funerary ritual and the burial ceremonies. These voyages extended as far as the Lebanons on the Syrian Coast in the North, and in the South, Somaliland and Southern Arabia. It is important to remember that these early navigators did not go to sea merely for idle adventure or for pleasure. They were impelled to embark upon such hazardous and dangerous tasks only by the most powerful incentives: to obtain the materials which they had come to regard as essential for the attainment of continued existence after death.

It must not be supposed that the few records preserved from these remote centuries give any adequate idea of the real extent of early maritime trafficking.

But there are other kinds of evidence which demonstrate its wide scope and influence.

One of the outstanding results of the study of Cretan archæology is the certain proof it has afforded of contact between Crete and Egypt almost at the dawn of the known histories of the two countries. This implies that Egyptian

1. Journal of the Manchester Egyptian and Oriental Society, 1916.

sea-going ships must have made their way to Crete in Protodynastic times, if not earlier. In my essay on "Ships, etc.," I have cited a small fragment of the large mass of data that is now available to demonstrate the fact of maritime intercourse between the Red Sea and the Persian Gulf at an equally early period. The remarkable identities between the earliest civilizations of Egypt, Sumer, Elam and Crete afford positive evidence of such contact of cultures; and there are reasons for believing that in the case of Egypt and Sumer the connexion was established mainly, though not wholly, by way of the Incense Land of Southern Arabia.

The preservation until the present time, in Burma and further east, of the earliest known type of Egyptian sea-going ship, which in Egypt itself was superseded by new developments in the art of ship-building before 2000 B.C., indicates that before the latter date these distinctively Egyptian models must have reached the Indian Ocean, and on some part of its littoral persisted until they were carried further east by some later enterprise.

The recent reasearches in Elam¹ have revealed the fact that the painted pottery which was being made there before 2000 B.C. was copied in Turkestan and Baluchistan not very long afterwards. This northerly and easterly spread of culture from the region of the Persian Gulf does not directly concern us in this discussion, in which I am not attempting to deal with the contact of peoples by land. But the derivation of this art of painted pottery in Elam is probably to be referred to Predynastic Egypt; and it may have been carried to the shores of the Persian Gulf, along with the knowledge of copper working, by means of the early maritime intercourse between the Red Sea and the Persian Gulf.

The easterly link of this bond was not strongly forged until the Sumerians learned from the Egyptians the ritual use of incense and began to exploit southern Arabia for it.

The extension of the use of copper to North-western India² is another indication of the easterly diffusion of culture, which is perhaps to be associated with the finding of painted pottery in Baluchistan.

But though the contact between Elam and India may have been brought about by land in the Third Millennium B.C., it

1. J. de Morgan, "Mission Scientifique en Perse."

2. W. Crooke, "Northern India," 1907, p. 18.

is possible that the exploitation of the western coasts of India for wood and spices may have been begun by sea also. Certain hints of this were suggested by Professor Sayce¹; but they are so slight that I would not attach much importance to them, if the completeness of the preservation in Burma of the type of Egyptian ship distinctive of the Pyramid Age did not suggest the possibility of such ships reaching India before they were superseded in the west by later models.

But by the time of the seventh century B.C., and I believe at least a century or more earlier still, regular sea-traffic between the Persian Gulf and the Malabar Coast was definitely established.²

Before we can appreciate the reasons for the sudden extension of the range of maritime adventure in the eighth and seventh centuries B.C., the nearest analogy to which is afforded by the exploits of European seamen in the fifteenth century A.D., we must consider certain events which were happening in the Mediterranean.

At the time when Queen Hatshepsut's great expedition went to the Land of Punt in the fourteenth century B.C. Egypt's maritime activity was not confined to the Red Sea, but also played a part in the Mediterranean.

But there were other nations who for several centuries had been engaged in sea-traffic there. Foremost among them was Crete, which had established a powerful thalassocracy controlling the seas of the Ægean, and in fact the northern waters of the Mediterranean from Syria to Italy.

When the Minoan power of Crete began to weaken, the control of the Middle Sea fell into the hands of the Phœnicians. These enterprising traffickers worked in intimate co-operation with the Egyptians, from whom they acquired most of their knowledge of ship-building and seamanship; but they were also able to avail themselves of all the knowledge and experience acquired by the Cretans, and to put to practical use the information concerning the stars which the peoples of Mesopotamia had collected for religious and magical purposes.

Hence these adventurous merchants, whose primary aim was to secure wealth by trading with the older and more conservative peoples, were able to command the results of all

1. Hibbert Lectures, 1887, p. 138.

2. T. W. Rhys Davids, "Buddhist India," 1911, pp. 113—117.

the experience of ship-building and navigation which the latter had laboriously accumulated.

They soon began to exploit, by land and sea, all the known sources of gold, silver, copper and tin, precious stones, incense and spices, pearls and coral. By the twelfth century B.C.¹ they had made their way to the western extremity of the Mediterranean, and passed between the Pillars of Hercules to the Atlantic coasts of Iberia and Mauretania. During the next three centuries they pushed further afield, to Britain and Ireland, to Denmark and Scandinavia, and eventually reached the amber coasts of the Baltic.¹

The literary and archæological evidence goes to show that after the Phœnician mining colonies were established in the Iberian peninsula, maritime intercourse was established between the ports on the Atlantic coast, such as Gades, and the countries rich in gold and tin, such as Brittany, Cornwall and the South of Ireland. Subsequently this exploitation extended to those parts of Sweden where metals were discovered.

Upon some of the rocks and megalithic monuments in the neighbourhood of these Scandinavian mines are preserved rough sketches of the ships in which these Phœnician mariners travelled. Though these impressionist drawings (Fig. 2), cut in the rough stones, are very crude, they convey a clear idea of the outstanding features of the ships which conveyed the first metal-workers along the coasts of Northern Europe.

The type of ship thus depicted is so distinctive that we can recognise it as identical in every essential respect with a much more ancient model which was in use upon the East Arabian Coasts, and from there spread to the uttermost limits of Asia.²

In the accompanying sketches (Figs. 1 and 2) I have placed in apposition a rough copy of the late Sir Henry Stanley's picture of a boat seen by him on the Victoria

1. And probably some centuries earlier.

2. I have cited the evidence in my essay on "Ships, etc," pp. 77 *et seq.* But precisely the same type of ship which the forerunners of the Vikings used in Scandinavian waters, perhaps ten centuries B.C., persists at the present time upon the Great Lakes of Africa (Fig. 1). So peculiar and distinctive is the mode of construction and the arbitrary method of decoration of these vessels that we can use them as certain tokens of the spread of civilization and the travel of ancient seamen from Egypt to Sweden.

Nyanza,¹ and a crude representation of a ship carved upon a rock at Tegneby in Bohuslän, which is referred to the Early Bronze Age.²

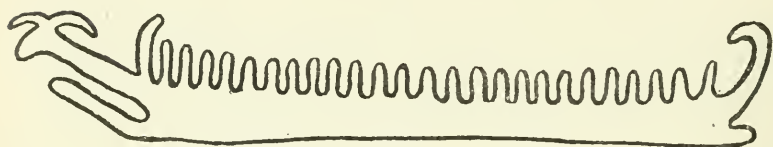
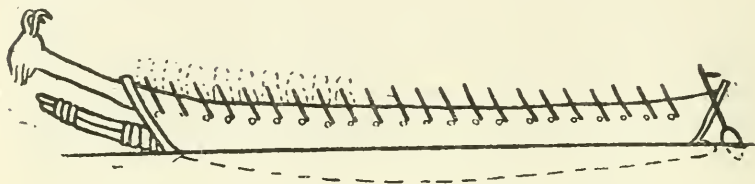


Fig. 1.—Sketch of a boat from Victoria Nyanza, after the drawing in Sir Henry Stanley's "Darkest Africa." Only the handles of the oars are shown. In outline the positions of some of the oarsmen are roughly represented.

Fig. 2.—Crude drawing of a similar boat carved upon the rocks in Sweden during the Early Bronze Age, after Montelius. By comparison with Fig. 1 it will be seen that the vertical projections were probably intended to represent the oarsmen.

The upturned hook-like appendage at the stem is found in ancient Egyptian and Mediterranean ships, but is absent in the modern African vessel shown in Fig. 1.

In my essay upon "Ships" (p. 79) I have quoted Sir Harry Johnston's account of the method of constructing these vessels. Their peculiar features are exactly reproduced in the ancient Swedish vessel. The remarkable forward prolongation of the keel and the bar attached to the actual bows of the ship, with the characteristic goat's or sheep's head (for either is used in East Africa) are certain tokens of the identity of origin. Even the number of rowers is almost identical. The only noteworthy distinction is the absence of the great outstanding curved stern of the Swedish ship. But this is a characteristic feature of the early Egyptian and Mediterranean ships, which has been omitted in the case of the vessels from

1. "Through the Dark Continent," 1878, Vol. I, p. 451.

2. Montelius, "Sur les sculptures le rochers de la Suède," Congrès d'Anthropologie et d'Archéologie, Stockholm, 1874, p. 454.

Victoria Nyanza, but retained as a distinctive badge of its origin by the Scandinavian vessel.

In his account of the construction of the "sewed boats"¹ of Southern Arabia, Zwemer tells us that "each boat has a sort of figurehead called the *kubait*, generally covered with the skin of a goat or sheep which was sacrificed when the boat was first launched"—a custom which in a modified form is still perpetuated in modern Europe by breaking a bottle of wine over the bows of the ship when it is about to be committed to the water for the first time.

Describing the exploitation of the Cassiterides, Strabo states that "formerly the Phœnicians alone carried on this traffic from Gades, concealing the passage from everyone." Elsewhere the same writer tells us that the Phœnicians excelled all other nations in their skill in navigation and by their expertness in the manufacture of purple-dye. As Rawlinson says:—"Phœnicia had [circa 1000 B.C.] no serious commercial rival, and the trade of the world was in their hands."

If we recall the united testimony of the Old Testament and the ancient Greek and Latin writers, we cannot refuse to recognise that the Phœnicians had almost complete command of the sea and controlled far-reaching commercial enterprises in the East and West. The fundamental factor underlying their material prosperity was the possession of a great mercantile fleet, and sailors who had the knowledge and experience to enable them to put out with confidence into the open sea, and, trusting to the guidance of the stars—more especially the polar-star, which the Greeks called "the Phœnician"—to sail by night. It was the expertness of her pilots which made other nations dependent upon Phœnicia, without whose help Solomon could not venture upon his greatest enterprises. At the time when the great easterly diffusion of culture took place the Phœnicians were the only people competent and able to direct such vast exploits by sea; and the combination of practices and beliefs that were so spread abroad affords abundant testimony to the fact that it was the Phœnicians, or sailors of other nations who had acquired both their methods and their cultural equipment, who directed and controlled the transference of Mediterranean civilization to the

1. The identical term used by the earliest Egyptian shipbuilders (*Vide supra*).

East and America. The use of the purple-dye, the conch-shell trumpet, and the distinctive blend of Egyptian, Babylonian and Mediterranean designs and ideas, all indicate that the influence of the Phœnicians who inaugurated this great Oriental drift of culture also continued to make itself felt in America long after it had passed out of the control of these great commercial adventurers.

At the time when they were busy in Western enterprises the Phœnicians were also exploiting the pearls of the Red Sea and Persian Gulf, the incense of Sabæa and Ethiopia, and gold and precious stones wherever they could be obtained in the neighbouring countries.

This lucrative trade only served to whet their appetites for yet bigger enterprises. Early in the first millennium B.C. the Phœnicians or their agents began to exploit India and Ceylon. The pearl-fishers of the Red Sea and the Persian Gulf played a large part in these expeditions, for one of the primary objects was the collection of pearls and other shells to which a special significance and value had come to be attached. Hence during their easterly wanderings the seamen settled upon any coast where pearls were found; and these places became the centres where the customs and beliefs of the Eastern Mediterranean and the Arabian coastlands were planted, and to this day have retained these persistent evidences of the alien influence that came from the west. The cultural uses of shells, such as the conch-shell trumpet, the cowrie and the pearl, naturally play a much more obtrusive rôle in India than they do in the West, because the immigrant elements of civilization which were introduced from abroad were brought by the men who were searching for these things. In his book "Shells as Evidence of the Migrations of Early Culture" [Manchester University Press, 1917], Mr. Wilfrid Jackson has collected the evidence in substantiation of this.

But the wanderers did not restrict their operations to the coasts: they roamed inland and searched for precious metals and stones. Wherever gold or copper was discovered the immigrants settled down to exploit such wealth, and not only left behind them such persistent records as megalithic monuments, but many distinctive practices, customs and beliefs.

The practice of terraced irrigation, the worship of the sun, mummification, the belief in a sky-world to which the blessed

dead go, and many scores of equally distinctive beliefs, legends and myths, blaze the pathway of these wanderers from the West.

It is important to remember that these people must have roamed over the whole of India. But the evidence of their presence is preserved only in some places and not in others because they settled down in the former to collect the gold or copper, the diamonds or sapphires, the pearls or shells.

To Mr. W. J. Perry belongs the merit of having called attention to the far-reaching significance of the search for precious metals, stones and pearls.¹

At the same time that these seamen made their way East to India others were pushing down the east coast of Africa. The indelible records of their visit still persist at Zimbabwe (see map, Z) in Rhodesia and elsewhere. They settled to exploit gold wherever they found it. The stone-buildings, the terraced hill-sides, the practice of mummification, and scores of other customs and beliefs still remain as an abiding witness to the coming of aliens and as a distinctive label of their identity and epoch.

In Southern Rhodesia, between the Salisbury-Beira Railway and the Limpopo River, there are numerous remains of an ancient civilization, which have been the subject of the liveliest controversies, ever since Carl Mauch in 1871 called attention to certain large stone temple-like structures of peculiar form. The Zimbabwe ruins have been claimed to be the work of ancient immigrants from Southern Arabia, who came to exploit the mineral wealth of Mashonaland, for the purpose of disposing of it in the markets of Ophir to the agents of King Solomon. Others have claimed that the trade was in the hands of the Phœnicians. An excellent summary of the history of this discussion before 1905 will be found in the late Professor A. H. Keane's Introduction to Mr. R. N. Hall's "Great Zimbabwe" (1905).

Sir Harry Johnston's "The Opening Up of Africa" (pp. 86 and 87—compare also p. 62) might also be consulted.

In the year of publication of Mr. Hall's book, Dr. David Randall-MacIver made a summary investigation of the ruins on behalf of the British Association, and in the following

1. W. J. Perry, "The Relationship between the Geographical Distribution of Megalithic Monuments and Ancient Mines," *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, Vol. 60, 1915.

year published the results in a book entitled "Mediaeval Rhodesia." The discovery of a piece of late mediaeval (14th century) Nankin china in the cement at the bottom of one of the structures¹ seems to have obscured all the other evidence in his eyes; for he came to the remarkable conclusion that these vast stone structures were devised and built by untutored negroes, such as the modern Kaffirs, not earlier than the 14th or 15th century A.D. Even Schoff, who accepts this extraordinary speculation, adds however that "the service done by Dr. MacIver in disproving the antiquity of this Kaffir kraal did not, however, need to be supplemented by his denial of the probability of Arabian trade far down this coast at a very early age" (*Op. cit. supra*, p. 97). Mr. Schoff then cites evidence from the "Periplus" and from Ptolemy in demonstration of the fact that at the beginning of the Christian era trafficking was being carried on by Arab sailors far south along the East African coast.

But even if the bit of Nankin china of the 14th century had been built into the foundations of the Zimbabwe ruin and the building itself erected at some subsequent period, this would not prove that local negroes planned and built this impressive monument without any prompting from others. We know sufficient of the negro's habits to realize that nothing is so alien to his nature as hard work, whether mental or manual, and especially his disinclination, except under the lash of the slave-driver, to engage in such, to him useless and meaningless efforts as the erection of stone buildings.

But the vast terraced slopes found in the Inyanga territory, as well as in the Lydenburg district of the Transvaal, an account of which is given in Hall's book (*Op. cit.*, pp. xxxiv and xxxv), representing the organised labour of tens of thousands of workmen, serve to bring us back to a truer perspective. Such methods of cultivation originated in Babylonia or Southern Arabia at least as early as the second millennium B.C., and they form one of the most distinctive elements of an unmistakable type of civilization which, in the earlier centuries of the first millennium, spread throughout a great part of the world, wherever there was gold to exploit and local workmen capable of being employed for such purposes.

1. Not one of the important ancient monuments.

The demonstration of this fact by Mr. W. J. Perry¹ is one of the most useful and clarifying results of modern ethnological research, and the proof of his inference has been established beyond question by Dr. Rivers, who called attention to the fact that in many places in Oceania, Africa and Europe, the Indian or Indonesian plant *taro* is found growing in the neighbourhood of the terraces.² The presence of this alien plant not only clinches the proof of the introduction from abroad of the idea of making terraces, but also suggests that this may not have happened until contact between India and the West was established. This argument, however, must not be insisted upon in the case of Southern Arabia, where the terraced method of cultivation is probably of considerable antiquity, certainly earlier than 1500 B.C. It may be asked, what evidence is there that the terraces south of the Zambesi were made many centuries ago? In the great diffusion of culture which began soon after 1500 B.C., the building of great stone monuments and of terracing the sides of hills was associated with the practice of mummification and many other curious customs and beliefs. These are all found intimately associated the one with the other in Mashonaland. We know what chiefly attracted the Phœnicians and determined the sites where they established their colonies. Pearl beds guided their course and the exploitation of deposits of gold and other metals was the anchor that held them to certain spots and not to others. It is inconceivable that the people, whoever they were, who exploited the pearl beds and the gold mines of the whole Asiatic littoral in the eighth century B.C., are likely to have overlooked the pearls of the Mozambique channel and the gold deposits on both sides of it, in Madagascar and Mashonaland (see map, Z). From the distinctive features of their stone buildings and their methods of mummification we know quite definitely that the peoples of Madagascar and South-East Africa did receive this alien culture, most probably from Phœnician sailors (see map, A), between the tenth and the eighth centuries B.C. It is probable that this intercourse between the shores of Southern Arabia and Rhodesia was

1. "The Geographical Distribution of Terraced Cultivation and Irrigation," *Memoirs and Proceedings of the Manchester Literary and Philosophical Society*, Vol. 60, 1916.

2. *Nature*, Aug. 17, 1916, p. 514.

still taking place at the time of the "Periplus." We know that it was in progress in the fifteenth century A.D., for Vasco da Gama found in Mozambique Arab ships laden with gold, silver and pearls.

The old culture which was planted in these regions nearly thirty centuries ago was thus kept alive right up till the coming of the Portuguese. Even if the great building at Zimbabwe was erected at the time of Vasco da Gama, it was not inspired by negro invention, but was merely the expression of alien ideas and practices which had been operating in Mashonaland for more than twenty centuries.

The mention of silver raises an important problem, for it is naturally to be assumed that the metal came from Mashonaland.

Many writers, from the time of Heeren onwards, have discussed the problem of the source of the vast supply of silver which King Solomon appears to have had at his command, so that he "made silver to be in Jerusalem as stones" (1 Kings X, 27). No doubt most of it came from Asia Minor and Spain, perhaps also from the Caucasus and Persia, or not impossibly even from Turkestan or the Altai, for the abundance of silver in Persia in the early times of its monarchy suggests that the latter sources of supply were being tapped then and possibly during the preceding centuries also.

But in the Old Testament we are told that Solomon "made a navy of Tarshish at Eziongeber, which is beside Eleth, on the shore of the Red Sea, in the land of Edom. Hiram sent in the navy his servants, shipmen who had knowledge of the sea, with the servants of Solomon. And they came to Ophir and fetched from thence gold four hundred and twenty talents, and brought it to King Solomon" (1 Kings IX, 28). "For the king's ships went to Tarshish with the servants of Hiram: every three years once came the ships of Tarshish bringing gold, and silver, ivory, and apes, and peacocks" (2 Chron. IX, 21). "And the servants also of Hiram and the servants of Solomon, which brought gold from Ophir, brought algum trees and precious stones" (2 Chron. IX, 10).

It is now widely admitted that Ophir was merely an exchange in South-Eastern Arabia whence the produce collected from all shores of the Indian Ocean were dealt with. Lassen¹ has given what seem to be conclusive reasons for

1. Quoted by Schoff, *op. cit.*, p. 175.

the derivation of some of these articles, such as the peacocks and the alnum trees, from Southern India. It may be argued that if the peacocks came from Eastern Asia viâ India, may not the silver also have come from Burma and Malaya? This is possible, and even perhaps probable. But, when we remember the vast quantities of gold and silver that passed through Ophir in Solomon's time, it seems certain that some of it must have come from Mashonaland.

In considering these problems the fact emerges quite definitely that the ships under Phœnician pilots were carrying on far-reaching trafficking, certainly as far as India, and probably to the shores of the Mozambique channel, at least as early as the tenth century B.C.

There are many reasons for believing that the adventurers who made their way to India did not limit their wanderings there. Though some of them settled down to exploit the vast stores of wealth lying unappreciated by the indigenous inhabitants, others pushed on to Burma as well as to the land of gold and spices in the Malay peninsula and archipelago. In these regions again the new comers settled wherever gold or pearls were found. Islands and territories which did not provide these kinds of wealth had no attraction for them, and hence their people were left in their pristine innocence and simplicity which we commonly label "savagery."

Writing in the latter half of the first century, Josephus makes the following remarkable statement with reference to the pilots furnished to Solomon by Hiram of Tyre: "To whom Solomon gave the command that they should go, along with his stewards, to the land that of old was called Ophir, but now the *Aurea Chersonesus*, which belongs to India, to fetch gold" ("Antiquities of the Jews").

The land to which this term is now generally admitted to have been applied is the Malay Peninsula, for, to quote Sir Hugh Clifford,¹ "the recent discovery in the Malayan State of Pahang—the home of apes and ivory and peafowl—of immense gold mines of very ancient date and of a workmanship that has no counterpart in South-eastern Asia, supplies an ample reason for the designation 'golden' so long applied to the Chersonese."

"M. Auguste Parie, in the second volume of his monumental work on Indo-China, contends that ancient Cambodia

1. "Further India," 1904, p. 13.

is the ancient Ophir" (Clifford, p. 12); but this claim will not bear examination. There can be no doubt that Ophir was the great mart in Arabia, whence the spoils of the Far East were brought.

Cambodia (see map, X) was the seat of one of the most remarkable ancient civilizations. It is of peculiar importance in the study of the migrations of early culture, because it received the impress of Western civilization, Egyptian, Babylonian and Indian, at a relatively early period; and by reason of its protected situation it preserved the effects of these influences long after they had become profoundly modified in the West. Moreover, as the extreme south-eastern corner of Asia it was the natural point of departure of the cultural drift from Asia to America, so that the early civilization of Mexico and Central America bears clear indications of Cambodian influence.

Western civilization probably reached Cambodia as early as the seventh century B.C., and the germs of its great culture were planted by the immigrants who settled there to mine for rubies and sapphires and the silver of the Cochin-China coast.

The coast of China offered little attraction to the ancient mariners, for the things they were searching for were very few and far between. But in Japan pearl-shell, gold and copper were found and were responsible for the planting in Japan of the germs of Western culture. This fact lies at the root of the remarkable contrast between the histories of China and Japan. The latter were inoculated with the powerful and disturbing stimulus of civilization at a time when the inert mass of China was yet almost uninfluenced except by the gradual and more peaceful penetration of Western influence in a very attenuated and much modified form. For the percolation of Babylonian culture into Persia, thence into Turkestan along the Thian Shan route (see map, J) into eastern China, was a gradual and insidious process, vastly different to the sudden irruption into Japan of swarms of rough sailors in a hurry to rob it of its precious metals and its pearls. These men also found gold in Korea and in the watershed of the Amur; and they settled down to exploit it, gradually making their way west along the river (see map, F) until eventually they seem to have met, near the headwaters of the Yenesei (see map, Y), the terminus of another, and

probably more ancient, band of gold prospectors who had been led to the "Mountains of Gold" (Altai) by the series of gold deposits stretching from Persia through Russian Turkestan (see map, *E*).

Stone Pyramids blaze the track of the men who wandered west from Manchuria (*F*), dolmens, smaller stone monuments and irrigation works those of the earlier band from Persia (*E*).

But the coastal wanderings of the ancient mariners did not cease at Korea. They pushed further north, and seem to have discovered gold at one spot on the Sea of Okhotsk (see map, *O*), the place where gold still occurs : there are also found ships revealing certain distinctive peculiarities of the earliest Egyptian sea-going vessels.

There can also be little doubt that the wanderings extended further still, to Alaska, and along the Pacific Coast of America (see map, *P*).

But there was another movement in the direction of America, which is of much greater importance to us in this enquiry (see Map, *B* and *C*).

When the sailors from the West arrived at the Malay Archipelago, perhaps in the seventh century B.C., and some of them proceeded north to the Philippines, Formosa, Japan and Corea, others pushed out towards the East, to the series of islands that reach out like so many stepping-stones into Melanesia, and still further into the Polynesian area of the Pacific Ocean.

As they made their way to the East these wanderers discovered the pearl beds of Celebes, Halmahera, and the Aru Islands, and then they worked along the northern coastline of New Guinea, settling and leaving the impress of their distinctive culture only in those places where pearls were found (Perry). They passed around the eastern end of New Guinea and settled in the Torres Straits to exploit its rich pearl beds. In no spot in the Far East has the imprint of ancient Egyptian civilization, and especially its methods of mummification, been more indelibly left than in the small islands that intervene between Australia and New Guinea.¹

One of the great problems in the interpretation of this great Oriental drift of Western culture is to offer an adequate explanation of the relatively slight influence exerted in Australia. We might have expected its enormous wealth of

1. G. Elliot Smith, "Migrations of Early Culture," pp. 21-30 and 92-98.

gold and pearls, precious stones and minerals, to have attracted the keen-eyed prospectors from the West, who do not seem to have failed to discover in the whole of the rest of the world, whether in Europe, Asia, Africa, or America, the sites where these kinds of wealth were to be obtained. There is ample evidence in the variety of the burial customs and beliefs of the aboriginal Australians that they were strongly influenced by a series of these alien exploiters of gold and pearls; but there is no indication, except possibly in the Northern Territory, that the wanderers from the West discovered the enormous wealth of the great island which they passed by on their way to the Pacific and America.

Why did not Australia become the seat of an empire rivalling that of the Incas, the Mayas or the Aztecs? Why were no monuments built there to provide another Zimbabwe conundrum for ethnologists to puzzle over?

The only explanation that suggests itself is the character of the aboriginal population.¹ It could not be driven to undertake the vast work which the Mashonaland negroes were enslaved to perform; and without the co-operation of the local people such highly organised enterprises could not be carried out by a mere handful of immigrants. But it is impossible that the enterprising seamen would not have devised some means of obtaining the gold if they had discovered it, whatever the character of the aborigines. What possibly prevented them from finding the gold was the fact that the presence of a local population may have deterred small groups of immigrants from prospecting a great territory, and the aboriginal people, with their mental limitations, certainly would not have rendered the immigrants much help in their search.

In the light of what we know these roving sailors to have accomplished elsewhere, we are driven to fall back upon the character of the great island-continent and the nature of its aboriginal population for an explanation of the failure of the wanderers to build up in Australia a great civilization such as they were able to effect in Mexico and Peru.

But though these sailors exerted a relatively slight influence in the Australian continent, in the smaller islands of Melanesia (see map, *B*), inhabited mainly by people akin to

1. In his Rylands lecture, which is now in the press, Mr. W. J. Perry hints at an alternative explanation.

the Australians, they were able to impress their culture more deeply. And when we proceed beyond Melanesia and reach Polynesia we enter a domain where entirely new conditions prevailed. So far we have been studying the wanderings of sailors who came as immigrants, bringing a leaven of new culture which they planted in a local population. I have just suggested that when the local population was too large and inaccessible, and possibly too stupid, the influence of the contact may be quite unobtrusive to the casual observer. But in Polynesia the wanderers themselves were the first colonists on the islands. There was at first no question of admixture. The mariners from the west discovered these islands when they were uninhabited. They planted the first colonies there. That is why the Polynesians present traits so strikingly reminiscent of the mixture of the so-called "Mediterranean" and "Armenoid" races of the West.

In the course of their wanderings they became intermingled with Ethiopians and Arabs and Indians and Malays, but the substratum of the original stock that populated Polynesia was composed of sailors from the Mediterranean and the Persian Gulf, into whose constitution the enterprising southern branch of the Armenoid race entered so largely.

But the fact that the wandering mariners were themselves the colonizers of Polynesia, which therefore became the most exclusively maritime population in the history of the world, is not the only new factor we have to study when we enter upon the domain of Oceania.

As far east as the limits of Indonesia we have seen that the mariners whose exploits we are studying were searching for gold and pearls. They displayed no interest in places where these and similar forms of wealth were not to be found. But when they reached Melanesia they seemed to have arrived at the easterly limit of the objects of their search. The pearl-beds along the northern coasts of New Guinea would have lured them on and directed their course into Oceania, but when they reached the islands of the Pacific they would discover that their ordinary inducements to settle down were missing.

If we can judge of their behaviour elsewhere we may assume that, as they visited island after island of Polynesia without discovering either gold or pearls, they did not stay, but pushed on further in the quest of such riches.

No doubt the great belt of pearl shell (see map, *B*) encouraged their hopes of finding pearls, and guided their course across the Pacific (*C*). But there can be little doubt that these hardy and adventurous mariners continued to push east until they reached the coast of America, where they found in abundance the pearls, the gold and silver and the other treasures they had kept constantly before their gaze as the goal of their desires.

Perhaps when first they made their way into Polynesia and discovered the multitude of luxuriant islands without inhabitants a certain number of seamen may have succumbed to the temptation of settling down to a life of ease and luxury in some of these attractive places. But what we have learned of their doings elsewhere suggests the possibility that the more energetic and enterprising of the wanderers did not sojourn in this way, but pushed on until they got their reward as the pioneers of the civilization of the Old World in America (see map, *C*).

From time to time no doubt boats were swept from the Japanese coast directly on to the shores of America by the "Black Current" (see map, *D*), and canoes travelling in the Pacific in the area intermediate between these great migration routes (*C* and *D*) were carried across the Pacific.¹

Much has been written concerning the wanderings of the Polynesians, which are of crucial importance in the discussion of the exploits of ancient mariners in every part of the world. The enormous expanse of ocean traversed by these simple sailors, and the accuracy of the means by which they were able to make their way to a given destination hundreds or even thousands of miles distant, are impressive and highly significant facts which give a sense of reality to the theory of diffusion of culture.

The story of the achievements of these Polynesian mariners has just been told again by Mr. Elsdon Best,² who perhaps writes with greater authority upon Maori beliefs and legends than any other scholar. In his graphic narrative he

1. See on this subject, Sittig's "Compulsory Migrations," *Smithsonian Report*, 1895.

2. "Maori Voyagers and their Vessels: How the Maori explored the Pacific Ocean and laid down the Sea Roads for all Time," *Transactions and Proceedings of the New Zealand Institute* for the year 1915, Vol. XLVIII, published 1916, p. 447.

describes the boats and their equipment, the food and the drink for the long journeys, and the meaning of the wanderings; and then gives accounts of a series of actual voyages ranging throughout the length and breadth of the Pacific Ocean.

When we consider the vast area of ocean known (by the positive evidence of race, language and culture) to have been traversed by these Polynesian mariners many centuries ago—from Madagascar in the west to Easter Island in the east, from Hawaii in the north to the fringe of the Antarctic in the south—it is wholly incredible that their wanderings were always confined within the limits.

To the islanders themselves the story of their voyages was the burden of their history. To the dwellers on the shores of Africa, Asia and America, where they must frequently have touched in their wanderings, sea-exploits could have been known by experience to only a small minority of the population, and actual participation in them to an even smaller number of people. Legends of sea-journeys would thus play a relatively insignificant part in the sagas of these dwellers upon the great continents, and would be lost in the mass of stories concerning other matters that affected their vital interests more nearly.

In this lecture I have not attempted to present the evidence in substantiation of the reality of the far-reaching influence of the Old World in the development of the pre-Columbian civilization of America. The earliest inhabitants of the New World made their way there along the route marked *G* in my map. Not far from the headwaters of the Yenesei (*Y*) their kinsmen still persist in the old homeland. These earliest immigrants into America naturally brought with them from the Old World the customs and beliefs of North-Eastern Asia.

After this first colonization of America people no doubt continued—and have ever since then done so—to dribble across the Bering Strait and along the Aleutian chain of islands (*P*). But the great cultural movement, which did not begin more than twenty-five centuries ago, passed mainly along the route marked *B* and *C* in my map.

It is quite unknown whether any contact with the Old World was established across the Atlantic before the time of Lief Eiricksson, the son of Eric the Red, who landed in

America in the year 1000 A.D. (after following a route roughly marked by the arrows *H* in my map).

It is not improbable that, once sea-going ships began to trade along the Atlantic seaboard of Africa, vessels out of control might occasionally have been carried by the trade winds (along the route marked *K* in my map), towards the Caribbean Sea. But we have no record of such exploits beyond certain vague American legends. The description given by the Carthaginian commander Himilco of a place in the Atlantic where "no wind wafted the bark, so motionless stood the indolent wave," and where "sea-weed abounds so as to retard the course of the vessel," suggests that the Sargasso Sea may not have been unknown to the Carthaginians. Whether the circuit of the world was completed in ancient times by Caribbean sailors, swept from the shores of America, being carried by the Gulf Stream to Europe (*L*), is also uncertain. There are vague hints of such events in the writings of Pomponius Mela and others.

In these remarks I have been trying, not so much to give the details of the voyages or the evidence in corroboration, so much as to suggest how vast a part early maritime intercourse has played in the development and the diffusion abroad of the civilization to which the world at large is now heir.

MAP. Rough chart of some of the early sea and land routes. Pearl beds are shown in black. Pearl shell areas are stippled. The sites of gold, silver and copper mines and precious stones which attracted ancient prospectors are indicated by spots. (See Frontispiece.)

A.—The ancient route to the Mozambique pearl beds and the gold mines of Zimbabwe (*Z*) and Madagascar.

B. and *C.*—The main route by which the ancient civilizers of America crossed the Pacific.

D.—The "Black Current" from Japan to America.

E.—The gold-strewn route from Persia to the Yenesei (*Y*).

F.—The gold-strewn route along the Amur from the Manchurian coast to the Altai (*Y*).

G.—The route taken by the original colonisers of America.

H.—The route taken by the Norsemen in 1000 A.D.

J.—The ancient route by which Western civilization reached China.

K.—The Trade Wind from the Canaries to the Caribbean Sea.

L.—The Gulf Stream.

M.—The route by which culture spread up the Mississippi (where pearls were obtained) from the Mexican area to the Great Lakes (for copper and gold).

N.—The sea route to Nigeria [the trans-African land route from the Nile is indicated by an arrow, but not labelled].

O.—Culture centre and gold deposits on the coast of the Sea of Okhotsk.

P.—The Aleutian route to America.

THE GULF STREAM AND THE WEATHER.

By JAS. JOHNSTONE, D.Sc.

(Addressed to the Society in the Geographical Hall on Tuesday, October 17th, 1916.)

The recent study of the effects of the Atlantic water circulation in high northern latitudes—a study of little more than twenty years' duration—seems to have had its inception in some purely scientific observations with respect to periodic changes in the floating or drifting microscopic organisms, or *plankton*, present always in sea weather. It is unlikely that this investigation would have attained the importance it had just before the war had it not occurred to certain Scandinavian biologists to attempt to associate this periodicity in the nature and abundance of planktonic life with periodic changes in the temperature and salinity of the water occupying the North Atlantic and its tributary seas. Later on these seasonal changes of temperature and salinity began to be associated with changes in the productivity of the North European fisheries, and also with the seasons of freezing up of certain Baltic seaports.

Obviously it was a matter of great practical importance to be able to forecast, in some degree, the productivity of, say, the Lofoten cod fisheries a year or so ahead, and to be able to anticipate the dates at which the winter ice-bound ports would close or open. The mere suggestion of such powers of prognosis gave the hydrographic investigation of the northern seas considerable practical importance, and led to its adoption by the Governments of most of the maritime countries of North Europe. From about 1906, therefore, these investigations have been vigorously pursued and were only interrupted by the outbreak of war in August 1914. About a dozen sea-going steam vessels were engaged in the research in the Atlantic, English Channel, Irish Sea, North Sea, Baltic and Norwegian Seas. In September of 1914 some of these vessels made their last cruises and since then the work has almost ceased.

During the course of the hydrographic investigations carried out under the general direction of the International Council for the Exploration of the Sea certain methods of

research were elaborated. Instruments were devised for the purpose of taking true samples of water from the sea at any required depth, however great, and for taking simultaneous temperatures. The water samples were afterwards submitted to chemical analysis, salts and gases in solution being estimated. It was known, of course, that sea water was a complex mixture of salts in solution, but it was found that the ratios of the abundance of these substances was constant even if their total concentration varied. A certain function, *salinity*, was established: the salinity is defined as the total weight of solids, in grammes, contained in 1,000 grammes of sea water, and it was found that the salinity could be determined from a knowledge of the chlorine contents. It was only necessary, therefore, to estimate the quantity of chlorine present (as chlorides of various bases, chiefly sodium of course) in an unit quantity of water, and then, by using tables, to find the salinity at any desired temperature. Methods were devised by means of which the quantity of chlorine could be determined rapidly with a degree of accuracy of one part in 100,000. At the same time, reliable methods of estimating the quantities of oxygen, nitrogen and carbon dioxide were evolved, and convenient methods of determining and counting the species and numbers of microscopic animals and plants (marine plankton) in unit volumes of the water were perfected. Much in the way of developing methods of hydrographic research was done during the last ten of the nineteenth and the first ten years of the twentieth centuries, and it is pathetic that the opportunity of practising these methods on a really adequate scale seems to be indefinitely postponed.

Coming now to the question of the Gulf Stream itself, we premise that the general influence of this current on the climate of Northern Europe is well known. Many indications, the drift of wreckage, the direction of the isotherms on the surface of the Atlantic, the contrast in physical conditions between Britain and Labrador, for instance, show that the climate of Northern Europe is greatly influenced by the Gulf Stream. We need not enter into a discussion of these details.

The Gulf Stream itself is the result of the driving force of the north-east and south-east trade winds, which cause the westerly-flowing Equatorial stream. If the earth did not rotate on its axis and if the sun revolved round the earth

(as in the Ptolemaic astronomy), and if the globe were uniformly covered with water, this would be the scheme of circulation : there would be an upwelling of water at both the Equator and the Poles ; surface water at the Equator would flow to north and south, and surface water at the Poles would also flow to south and north ; the surface water flowing north and south from the Equator would be warm and relatively dense (because of evaporation), and as it cooled down it would become denser, and thus sink below the surface, and continue to flow along the sea-bottom to north and south ; the surface water flowing south and north from the Poles would be cold, and so dense, but it would be less dense than average sea water at the same temperature because it contains melted ice ; as it flows towards the Equator it would mix with the sea water *in situ*, thus become denser, and so would sink below the surface and continue to flow along the sea-bottom towards the Equator.

Now it can be shown that, as a result of the earth's rotation, all freely flowing currents of water and air tend to be continually deflected to the right-hand side (in the northern hemisphere), or to the left-hand side (in the southern hemisphere), therefore the above scheme becomes modified. The northerly flowing surface drift from the Equator becomes deflected towards the East, and the southerly flowing drift from the North Pole becomes deflected towards the West.

Further, this scheme becomes modified because of the existence of an atmosphere on the earth. There are currents in the atmosphere set up by the heating effect of the sun and the rotation of the earth. One of these currents is the system of almost constant trade winds. These *drive* the superficial layers of sea water along in the direction in which they blow, and so instead of a northerly drift of surface water from the Equator, tending all the while to deflect to East, we have the westerly flowing Equatorial Stream. *Nevertheless* this westerly flowing Equatorial Stream tends always to become deflected to the right (in the North), that is, to the North ; and the left (in the South), that is, to the South. And so, even if the Isthmus of Panama were not there to stop the westerly flowing Equatorial Atlantic Stream and cause the latter to bend to the North this would still happen (but to a lesser degree) even if the whole earth were covered with ocean.

Now for the Gulf Stream properly so called. There are

really two Equatorial Gulf Streams—north and south. The southern one impinges on Cape San Roque and divides into one branch which flows along the coast of Brazil, and one which flows north and joins the north Equatorial Stream. The latter further divides so that one branch flows into the Gulf of Mexico, and the other flows outside the West Indian Islands towards the north-eastern States of America; this latter drift is probably the most considerable. Water becomes banked up (and heated) in the Gulf and flows out through the Straits of Florida as the true Gulf Stream.

Here the current is very definite; it is about five miles wide, and extends to the bottom at a depth of about 350 fathoms, and it has a velocity of about 100 miles a day. Outside the Straits the Gulf Stream joins the branch that we have seen to pass outside the West Indian Islands, and the compound stream continues to flow north close to the American coast, as far as Cape Hatteras. Its temperature here is about 20°C (68°F.) and its salinity is over 36 parts per thousand. Now it begins to lose heat as it flows north, and all the time it is being deflected to the right (that is to East) so that at about latitude 40°N. it flows almost due East.

This is the first component of the North Atlantic circulation; the other is the Labrador current. The Gulf Stream consists of water which is warm and of high salinity, the Labrador current of water which is cold and of low salinity. The latter flows almost south from Baffin's Bay and Davis Straits, hugging the coast of America. At about latitude $41\frac{1}{2}^{\circ}\text{N.}$ and longitude 50°W. the two streams impinge on each other.

From about this region the Gulf Stream loses its individuality. It radiates out so that one branch flows towards Iceland and the Færoe Islands, another towards the English Channel and the Bay of Biscay, and a third curves round towards the African coast to South and South-West, as the Canary current, and rejoins the Equatorial Stream circulation. Thus there is a huge eddy of relatively warm and dense water in the Atlantic Ocean. In this the salinity may rise to nearly 38 per thousand. All round the Eddy there is water of lower salinity. In the centre of the eddy is the Sargasso Sea.

All the above is the well-known scheme of the Gulf Stream circulation: now we turn to the results of more recent work.

The great Atlantic eddy is variable in its area, expanding

towards the north from March to November, and contracting towards the south from November till March: this process of expansion and contraction can be traced by studying the courses of the lines of equal salinity (*isohalines*) and lines of equal temperature (*isotherms*). Now this annual pulsation (due to obliquity of the earth's axis, of course) can be felt all over the northern seas, for since water drifts slowly to north and east from the eddy the quantity reaching the shores of Northern Europe will be greatest when the eddy is greatest, and *vice versâ*. The *drift* (not *current*) of water from the Atlantic Gulf Stream eddy towards Europe is, of course, a very slow one: physical-mathematical investigations show (and empirical observations confirm) that the flow through the Straits of Dover into the North Sea is about three miles in 24 hours; through the North Channel, out from the Irish Sea about four miles in 24 hours; and through the Færoe-Iceland Channel, over the Wyville—Thompson Ridge about 6.2 miles in 24 hours. In the open sea the rate of flow is very much less, and a water particle will take about two years to travel (as part of the general body of water or drift) from the Wyville—Thompson Ridge to the Arctic (Barentz) Sea just west of Spitzbergen. Nor is the flow constant in rate and direction, and all over the Norwegian Sea between Iceland, Greenland, Spitzbergen and the coast of Norway the flow is broken up into innumerable eddies, which are themselves variable in space and time. *Still* the general drift is from the Mid Atlantic towards the north-west coasts of Europe, and into the tributary seas, such as the North Sea, Irish Sea and Baltic. Obviously the Baltic is colder and fresher than the North Sea, not so much because of the difference in latitude and the inflow of river water as because of the much more restricted entrance which impedes the inward flow of warm and highly-saline Atlantic water.

Now we come to consider the apparent irregularities in the drift to north-east of Atlantic water. These irregularities have been the real object of the hydrographic investigations, and all research has been directed to the discovery of their periodicity. There *are* periodicities of different degrees, thus there is, apparently, an eleven-year period which seems to coincide with the period of variation of sunspots. Probably there are other smaller periods of variability in the flow of the Gulf Stream water, but so far we have very little data

with regard to these. Then there are probably very long periods, and one such of over a century in duration is suggested by some curious facts in relation to the Swedish herring fisheries. Only by long study can we hope to discover all about these truly periodic variations, and in the meantime we find it sufficient to describe the conditions with regard to the strength of flow of Gulf Stream drift water from month to month. That means a good deal for the change in the strength of flow, as this is observed say south-west from Ireland, is reflected some months later on, as lesser climatic changes in the lands bathed by this water.

The general connection between the climate of North-Western Europe and the Gulf Stream drift is well known. Thus Moscow, Edinburgh and Labrador are situated in nearly the same latitude. Moscow is cold, and has extreme variations of temperature, because it is far from the sea; Edinburgh is relatively warm, and the temperature range is rather small because it is near the sea and the inflowing relatively warm water from the Atlantic; while Labrador is cold because it is bathed by the cold water of the southerly-flowing Arctic Stream. Promontories, or bold projections of the land exposed to the Gulf Stream drift have a genial climate: Cornwall and Anglesey are examples on a small scale, each being nearly in the core, so to speak, of a branch of the Gulf Stream drift. The relatively warm sea affects the adjacent land mainly because winds blowing in from the sea convey heat to the land by actual contact, and also by transferring the heat absorbed by evaporation. This latent heat is given up to the land in rainfall.

Now by merely recording (1) the variations in the strength of flow of Gulf Stream water, and (2) the conditions with regard to land temperature, crops, &c., a good deal can be learned. Thus it has been established that these conditions go together.

Weak Gulf Stream Flow :

- Low sea temperature in the winter of North Europe.
- Low air temperature in Mid-Europe.
- Little ice at Newfoundland in the spring.
- Much ice at Iceland in the spring.
- Bad wheat crops in West Europe.
- Bad rye crops in North Germany.

Strong Gulf Stream Flow :

High sea temperature in North Europe in winter.

High air temperature in Mid-Europe.

Much ice at Newfoundland in spring.

Little ice at Iceland in spring.

Good wheat crops in West Europe.

Good rye crops in North Germany.

The important thing is that the condition of the Gulf Stream drift *precedes* the other conditions, so that given that the Gulf Stream drift in winter is observed to have become stronger than usual to the S.W. of Ireland then we may expect a higher air temperature and better crops in these islands and in Europe during the following summer and autumn. The change in the Gulf Stream is detected in actual practice by noting that the salinities and sea temperatures at the fixed hydrographic stations and at the fixed times of observation have changed. After each of the periodic cruises which were made every three months by all the participating vessels, all the observations were collated. Isohalines and isotherms were plotted on charts, and from the positions of these contours it could be seen whether the Gulf Stream was stronger or weaker than the mean, or than it was in the corresponding period of the previous year.

Thus it became possible actually to forecast the general nature of the weather some six months or so in advance. Little of this kind of forecasting was actually attempted since the data were hardly abundant enough to make it worth while risking one's reputation. Still it was possible, and a much more highly developed system of observations would have made it quite a practicable and successful venture—of that we may be sure.

A word or two in conclusion as to weather forecasting. The daily weather forecasts are based on the distribution of atmosphere pressure: decreasing pressure—the advance of a cyclonic system—spells wind and rain, while increasing atmospheric pressure—the advance of an anticyclonic system—means calms and a rise of temperature (in summer) or a fall (in winter). Now is it possible to anticipate the formation of a cyclonic system a few days in advance? No doubt it will be in the future.

The usual charts showing the courses of the isohalines and isotherms over the sea are drawn with very little detail

because so far there were always rather few observations. But if, as sometimes happened, the observations were numerous, then it was apparent that the isohalines and isotherms had very complex courses. There might be "islands" of relatively warm and dense water surrounded by water which was colder and lighter. Further, the distribution of warm and cold water is *generally always* changing.

Suppose now that a large "island" of warmer water becomes established, for a few days, out in the Atlantic west from Ireland. The result will be the formation of a cyclonic atmospheric system, or disturbance. Over the "island" there will be increased evaporation so that the atmosphere becomes lighter and pressure falls—there will be an up-streaming of air and a circulation inwards of air from outside the "island" to take the place of that which ascends. When once a cyclone has become established it possesses a kind of permanence, and it begins to travel in a certain direction—either to north-east (if it is formed out in the Atlantic) or to the south (if it is formed over the Icelandic low pressure area). In a day or two it will travel over the adjacent sea and land, carrying with it its particular train of weather conditions.

Given, therefore, that there are sufficient hydrographic observations to enable us to chart the distribution of warm and cold water out in the "storm-factories" of the Atlantic we ought to be able to detect the formation of these large isolated patches of warm water. The latter will endure for some time, and while they last each of them will be the place of origin of cyclonic disturbances. Probably if the formation of one such "island" is observed we should then be able to forecast a month, more or less, of cyclonic disturbances.

But, of course, predictions, such as these, mean the accumulation of much more numerous data than was possible under the pre-war schemes of hydrographic research. The expense of such observations would be little in comparison with the results that might be their consequence. It is for programmes of "reconstruction" in the period after war to elaborate and practice the accumulation of hydrographic data in order that weather prediction may become a very successful and profitable service.

“GREECE AND SOME OF THE ISLANDS IN THE
ÆGEAN SEA.”

By JOHN B. GASS, J.P., F.R.I.B.A.

(Short Summary of a lecture delivered to the Society on Tuesday, November 27th, 1917, illustrated by about 60 water-colour sketches made by the lecturer during his visits to the Near East, and by a most interesting collection of original lantern slides prepared mainly from photographs by Mr. Youatt specially for this lecture).

The charm of the Mediterranean, the Summer Sea, with its glowing colour and wealth of legend of classic times was described, and the architectural interest of Sicily with the remains of the Greek occupation. The islands of the Grecian Archipelago seem the very stepping-stones from the further East of that wonderful civilization which developed in Greece and, travelling westwards, still influences the civilization, art, literature, philosophy, politics, and religion of our modern times. The interests of Greek travel are not in the things of to-day, but in the conditions and progress of a wonderful people over 2,000 years ago. Mykenæ, in its architectural character, is a late offshoot from Minoan Crete. In the Homeric age and story it was the first city in all Greece, and had command of the trade routes, but was practically destroyed in the Fifth Century B.C. The Mykenian King, Agememnon, was the most powerful king in Greece, and led the forces at the siege of Troy. The royal tombs are within the walls in the lower part of the town, and here in 1876 were discovered the beautifully beaten gold plates which had covered the royal bodies, the wrought gold cups, the weapons and trinkets of gold and jewels and the richly decorated pottery. All these products of a civilization extending probably from 1500 to 1000 B.C., shew how the people of this old city had advanced in the arts.

Epidaurus, at the end of a long valley sheltered from the cold winds, but in the purest air and on a mountain plain, was the great open-air cure establishment and the temple of Æsculapius. In Greece these temples and their enclosures

supplied the places of the public hospitals, and while the patients slept in the temple or in the colonnades which were open to the air, the god, represented by his ministers, came to attend to their ills, and the sacred dogs and snakes licked their sores. There are the remains of the great dormitories like the sanatoria of to-day, pump rooms for hydropathic treatment, gymnasia for physical exercises, a stadium for games and running, and for amusement a large open-air theatre, one of the finest in Greece, still in good preservation, and with accommodation for 16,000 spectators, where all could see and hear. The island of Ægina became subject to Epidaurus, and a silver mint was established there. But it attained independence in the Sixth Century B.C., maintained its own fleet, built the celebrated temple of Athena, and became the chief seat of Greek art.

The islands of Santorin and Melos are both volcanoes, and the bays are formed in the craters which have some activity in their depths even now. Santorin, "The Beautiful Isle" of the ancients, is a sun-baked, sulphurous ash heap, with decomposed pumice stones and lava, in layers or streams forming the sides of the wide crater: vines grow freely, and are irrigated by rain water, the only water supply to the island, and from these vines a very fiery wine is made. The central isle in the crater bay was formed about the time of Christ, and comparatively recently the centre was again in eruption. Melos, the most westerly of the Cyclades, is of special interest, for on the site of the ancient city was found in 1820 the beautiful Venus of Milo, which was buried deep down in the earth where she had lain for nearly 2,000 years, and is now one of the chief glories of the Louvre in Paris. Greek art was developed from Egyptian models; this Venus is of the later period of Greek art, and was worshipped at Melos, where there are still types of her perfect Greek beauty. Parts of the old city were unearthed by one of the Kings of Bavaria, and more recently by students from the British School in Athens, who discovered the remains of Cyclopean buildings. In the flint ages Melos was the Sheffield of the Seas, for here was found obsidian—that steel-like flint of which the finest cutting instruments were made in the far-off days of the flint age of Greece.

Delos, the sacred isle of the Greek confederation, was in legend called out of the deep by the trident of Neptune, the

god of the sea, and fastened by Jupiter with adamantine chains to the bottom of the sea to become the birthplace of the great sun god Apollo and his twin sister Artemis, who represents the beauty of Maidenhood. On the hillside is the prehistoric cave of Apollo's birth and his first shrine. Magnificent temples were erected in Apollo's honour, and the island became the central meeting place, the treasury and the Sacred Isle of the Greek confederation. It grew in importance, became the favourite seat of commerce, and as many as 100,000 slaves are said to have been sold in one day there. Becoming the centre of religion and pleasure, its festivals were thronged by merchants from all the classic world. But it fell from its high estate in the 2nd century A.D., and now lies in a trance of sleep, uninhabited and barren. Excavations have recently been made by a group of young Frenchmen, who have unearthed some old buildings of great interest.

Everywhere in Greece, both on the mainland and on the islands, there are reminders of the dead and gone ideals of the mystery of the supreme Being which in all lands, and in all ages, has found an expression. The Greek ideals were developed on the thoughts of the farther East, and founded really on the noblest and highest ideals of manhood and womanhood, and with attributes which exemplified the ever wondrous forces of nature or the high or low ambitions of mankind. The reality of this worship to the dead and gone people is seen in the temples which are unearthed from the kindly soil. Their desolation has received protection from mother earth, and now, nearly 2,000 years after their destruction, and with their surrounding buildings, give pictures of the life of the times full of interest to all scholars. But there are also the records of the early Christian Church and St. Paul's work in Greece. The wonderful book of the Revelation of St. John the Divine was written in 'the isle called Patmos' in the *Ægean* Sea. Many candidates for the ministry of the Greek Church study in the precincts of the Monastery which contains the cave of the Revelation. On the deep natural lintel are the cracks from which the great voice as of a trumpet was said to be first heard. In the deep blue sea and lying as it has done for ages, is a great dragon-like rock, perhaps the great dragon which was cast out. The greatest treasure of the Monastery of St. John, on the highest part of the island, is the most famous and reputed oldest manuscript of the gospel of

St. Mark, the purple manuscript, complete with the exception of a few leaves. Other famous manuscripts and old-world books are also carefully guarded.

Samos, which has Home Rule, is one of the largest and most prosperous of the Greek isles. Though nominally still under Turkish protection it has its own little army, its own National Assembly, and a constant succession of princes who are changed every election. The Greek nation and the islands were subject to Venice in the 15th, 16th and 17th centuries, and the Venetian Castle still guards the harbour. Near by the Athenian fleet defeated the Persians. On the hillside is a monastery which was one of the temples of the oracle Sibyl, who was consulted by the gods. On the plain below the prehistoric city wall, is a solitary column, the only one remaining of the great temple of Hera, the largest temple of its time. One of the wonders of the world was the famous aqueduct cut through the solid rock to bring water to the cities on the plains. These have now disappeared, but the channel, about 40 feet deep, still remains, though nearly dry.

In the land-locked bay of Navarino the combined fleets of England, Russia, and France defeated the Turkish fleet in 1827, and it is said the wrecks can still be seen down in the depths. In classic history it is chiefly famous as having on its shores the plain where the Athenians surprised and defeated the Spartans B.C. 425, after they had defeated their fleet and blockaded the island. The bay is controlled by the Venetian Castle on the heights, and in the straits are others of these castles and fortresses.

In the modern Greek funerals the dead are carried through the streets dressed in all their finery, with their faces fully exposed. There was much pathos in the funeral of an old woman and a little child in Athens, particularly in contrast to the royal procession seen at the same time going to the Cathedral to celebrate the Greek independence. The ancient Greeks had a strong belief in the life after death, thinking that their departed were only journeying to another world where they would require the same things they required in this world, and with their dead buried the figure of a protecting god or goddess, the water jars and the bread platters they might require on their long journey, food and clothing, a lamp to light the way through the dark and gloomy space under the earth through which the Shades pass into Hades; armour

for the men, dolls and playthings for the children, and a mirror was an indispensable article for a woman. To each one was given a coin, placed in the hand or mouth, to pay Charon, who conveyed in his boat the shades of the dead across the rivers of the lower world. A honey cake was put in as a sop to be given to Cerberus, the three-headed watch dog of Hades. To be buried without honour and to occupy a neglected tomb meant that your wretched ghost became an outcast and a wanderer in the under world. In a beautifully-designed lead coffin was seen all that was left of a little girl who died two thousand four hundred years ago. At her head was the terra-cotta figure of her protecting goddess, by her side were the water jars, the food trays and the lamp for her journey. In her little hand was the coin to pay Charon for the long journey across the waters of the under world, put there no doubt by anxious loving father and mother grieving in the long long ago for their little girl's lonely journey. All these vessels were beautiful in shape and artistically ornamented. These graves give much knowledge of ancient Greek manners and customs, and the museums contain many examples of great interest. On the plains of Argos, near Nauplia, there are frequent finds of these tombs by the peasants when working in the fields.

The Bay of Arcadia is the harbour for Olympia, which is about 120 miles to the south-west of Athens and about nine miles from the sea.

The Olympian games of old were of the nature of a religious festival, and exercised great influence on the character and fortunes of the whole Hellenic nation. From the 8th century B.C. and for upwards of 1,000 years, every fourth year witnessed the games. A sacred armistice prohibited all warfare during the month of celebration, and the chosen champions contested for the garland of wild olives, the prize most coveted in the Greek nation. There was no town only the walled enclosure called Altis, and sacred to the god Zeus. Temples, dwellings for the priests and buildings in connection with the games occupied the enclosed space which is fallen into ruins and covered deep in mud and sand by the river floods, but was excavated from 1875 to 1881 by the German Government at a cost of thirty thousand pounds, and to-day there can be traced the life history of the place written in stone. The Heræon is probably the oldest Greek

temple in existence, and in the centre of the enclosure stand the remains of the magnificent temple of Zeus, completed in the middle of the 5th century B.C. to hold the great statue of the Olympian Zeus in gold and ivory by Pheidias, one of the world's masterpieces of art, removed to Constantinople on the suppression of the games in 393 A.D., and there accidentally destroyed by fire. There were treasure houses, minor temples, gymnasium, baths, and residences for the priests and competitors in the games which took place in the Stadium, where 45,000 spectators could be seated. From the Kronos Hill the Stadium could be overlooked, and probably 100,000 people gathered together. Only persons of pure Greek blood might contend for a prize, and barbarians were only admitted as spectators. No woman might be present under penalty of being hurled to death from a steep rock near by. During the first 50 years the games consisted of foot races, but later of the five-fold exercises of leaping, running, throwing the discus, throwing the spear and wrestling. Later still the Hippodrome was built, and chariot and horse races were introduced. Orators, historians, and other authors of celebrity read their works aloud to the spectators assembled. The festival ended in processions and solemn sacrifices to the gods. In the early times athletic exercises were a necessary part of the training of every young Greek, and the games were purely amateur, but eventually the competitors were wholly professional. Alexander the Great refused these men for his wars, finding those he had taken cowardly and unreliable. A Christian Church was established in 394 A.D., but earthquakes destroyed all the temples, and the river floods completed the destruction and buried the ruins in the mud.

In considering the history of a people the nationality and characteristics of the historian have always to be borne in mind. Athens is looked upon as the great centre of Greek action and the fountain head of Greek art and literature. In a measure it was so, but the writers were all either Athenians or in sympathy with that State, therefore the glories of Athens and the Athenians are magnified to the greatest extent, and the Spartans, Corinthians, the people of Ægina, Argos, and others of the Greeks are somewhat belittled. In its earlier history the progress of the useful and ornamental arts had scarcely been so great in Athens as in the other parts of Greece, but gradually the dignity of the Republic advanced

among the states of Greece. The Athenians organised their fleet so that they became the most powerful on sea, and acquired a command over the resources of the greater part of the islands and colonies of Greece, and became the virtual head of the Greek Confederation.

There are interesting traditions of the foundation of Athens, but it was not till the 6th century B.C. that the city began to assume any degree of splendour. The Acropolis Hill which dominates the city was originally a fortress, but became a vast sacred enclosure, approached by a winding road and a great flight of steps. Of all the dwellings of the Virgin, and the Virgin goddess of the Greeks was Athene, the Parthenon, which crowns the Acropolis Hill, is the most beautiful and perfect building the world has ever seen, the secret of its strength veiled in grace. Built of marble, and with the great columns so beautifully proportioned, this building gives a sense of mystery with its soft glow of colour and delicacy of outline. In the temple was the statue by Pheidias, of the maiden goddess Athene, 39 feet high, in ivory and gold. Sculptured slabs and friezes by Pheidias and his school ornamented the exterior, but much of the sculpture has been destroyed or removed. A French guide book bought in Athens says "the earthquake of 1687 and Lord Elgin completed the work of destruction, and it is to the British Museum in London that we must go to admire so many of the master-pieces of the best period of Greek art."

There are many other temples and shrines in the Acropolis, each wonderful in its way, and the whole air is filled with their beauty. Pheidias was the artist in charge of all the work in the Acropolis, and having made a glory for the Ages he went to Olympia, and there made his great statue of the Olympian Zeus, the most wonderful of his works. His work had beauty of a sublime order; he set himself free from the stiff and unnatural forms of the Archaic School, and imparted a dignity and largeness of style to sculpture which had not previously existed.

Pericles, his great patron, had fallen a victim to the jealousy of political rivals, and, when Pheidias returned to Athens from Olympia, he fell with him, being charged with fraud and impiety. He proved the true weight of the gold in the Athene statue, as it was made removable. But the impiety was a more serious matter. In the battle of the

Amazons, which he designed, on the shield of the goddess were found sculptured likenesses of Pericles and himself. Whether this was an insult to the Amazons of the time or to the goddess is not recorded, but he was thrown into prison, and died there in B.C. 432. Thus this nation rewarded the greatest artist the world has ever known.

The temples of Theseus and Zeus, Mars Hill, where St. Paul preached, the monument of Lysicrates, the Tower of the Winds, and other interesting remains are to be noticed. The Athenians worshipped, legislated, and viewed dramatic representation under the open sky, the heads of invalids and travellers only being covered.

A country with so rich a history as Greece has so many interests that it is a veritable gold mine for the traveller who cares for the things of the past. To an architect it is the dreamland of his student days; to the sculptor, to the student of literature and philosophy, to the politician, Greece has still a message to-day. The isles of Greece have still their self-contained life and varying characteristics. The religious ideals of the world have changed, but there is much in modern thought running parallel to the thought of the early days. The good the people strove for has not always been attained, but they have left a past of golden story.

Being heirs of the ages the nations of the civilized world to-day have great responsibilities because there are such great opportunities; were these responsibilities realized and the opportunities taken to-day would be the Golden Age of the world. But it is not!

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

CONFERENCE OF DELEGATES OF THE CORRESPONDING SOCIETIES.

(Report by HARRY SOWERBUTTS, A.R.C.Sc., Delegate of the Manchester Geographical Society, taken as read at a Meeting of the Society held on Tuesday, October 16th, 1917.)

As the Annual Meeting of the Association for 1917 had been cancelled, the Conference of Delegates was arranged to be held in London on July 5th and 6th, 1917.

There was a fair attendance at the three Meetings held in the Rooms of the Geological Society, Burlington House, on the Thursday morning and afternoon and the Friday morning.

The President of the Conference, Mr. John Hopkinson, F.L.S., F.G.S., gave an address on "The Work and Aims of our Corresponding Societies." He began by giving a short historical sketch of the growth of the work of the Corresponding Societies, first describing the origin of the Conference, as follows:—

"It is nearly forty years since I suggested that the Delegates from provincial societies should hold a Conference at each meeting of the British Association, subsequently arranging for the first Conference to be held at Swansea in 1880. Although sanctioned by the Council of the Association it was not an official Conference, being the first of five managed and supported financially by the Delegates only. Having then been in the Chair I accept with the greater satisfaction after so many years the honour conferred upon me to preside at the present Conference.

"At the Conference held at Swansea in 1880 the following resolution was passed: 'That this Conference recommends that at future meetings of the British Association the delegates from the various scientific societies should meet with the view of promoting the best interests of the Association and of the several societies represented.'

"The main object of our Societies is, or should be, to undertake local scientific investigation, and we are here assembled chiefly to discuss the best means of doing so and of

obtaining the most valuable results. While all should work to the same end, that end, whatever it may be, can best be achieved by all working in the same manner, or at least on some definite plan, so that the results may be comparable.

"It is not, however, to stimulate and direct scientific investigation only that this Conference should aim; there is also for it the wider field of influencing public opinion on the importance of far greater attention than at present being given to scientific education and to many problems concerned with the future welfare of our nation in which science may lend a fostering hand."

The President then gave a detailed description of the work done by the various Societies, arranged in accordance with the Sections of the Association. The following four extracts specially concern the members of our Society :—

"Section A, Mathematical and Physical Science, ought to be divided as it is in the French Association, which has a Section dealing with the Meteorology and Physics of the Globe. Meteorology in our Association is almost ignored, and yet there is no other science to which assistance can be so easily rendered by the members of our Corresponding Societies, nor one in which uniformity of observation is so important. Observations need only be taken once a day, at 9 a.m., and are mostly only taken at that hour, but may also be taken at 9 p.m.; if three times a day, the other hour is 3 p.m.; in 'summer time' necessarily an hour later by the clock.

"The chief object for which meteorological observations are taken, apart from that of forecasting the weather, is to arrive at a knowledge of the climate of a place, and we can only compare the climate of one place with that of another from the results of observations taken at the same local time at each place, that is, at the same interval of time after sunrise. This does not vary so greatly within the area of the British Isles but that Greenwich time gives satisfactory results, and with rainfall only the difference is of no moment. Suggestions for certain meteorological observations were given by Mr. Symons in the address referred to, but with evident intent he does not specially treat of the subject to which he gave his greatest attention—rainfall. Although since that address was delivered observers of rainfall have increased in number in the British Isles from about 3,000 to 5,500, the variations in

rainfall from place to place are so great that many more observers are still required, especially in Ireland, in the western counties of Wales, in Shropshire and Staffordshire, and along the east coast of England. Each delegate should see to it that his own neighbourhood is adequately represented. A knowledge of the mean and extreme rainfall in any district is most important in relation to water supply and agriculture, and it can only be gained from the records of a great number of rain-gauges taken for many years. Dr. H. R. Mill, Director of the British Rainfall Organisation, has twice brought the subject before the Conference of Delegates, and has added to records of rainfall more records of bright sunshine as urgently required. Observations with a Campbell-Stokes sunshine-recorder give little more trouble than those of rainfall with a Snowdon rain-gauge, but it is not so easy to measure the records, and the instrument is expensive.

“For Section C, Geology, much good work has been done by the Corresponding Societies, especially for the Committee on Geological Photographs, which was formed by the joint action of the Section and the Conference of Delegates at the Bath meeting in 1888. The photographs (a very large number) are deposited in the Geological Museum in Jermyn Street, where they may be seen; also numerous lantern-slides which are lent for lectures. The Committee is still in existence and photographs are acceptable.

“Other important geological subjects which have been brought before our Conference are earth-tremors, underground water, and coast erosion, in the investigation of one or other of which all our Corresponding Societies may help.

“Taking now Section E, Geography, it is not a science which can be much advanced by the concerted action of our Societies, except by urging its efficient teaching in schools. With the branch of it called topography we have more concern. It should be our first aim to define the area of our operations precisely and in accord with neighbouring societies so that there may be no overlapping in our investigations, and to work that area thoroughly. For this purpose our 6-in. to the mile Ordnance Map is essential. The methods of our Ordnance Survey have been severely criticised at our Conferences, especially with regard to the inch-to-the-mile maps, now much improved, but too dear for a ready sale.

“In Section H, Anthropology, the work of the ‘Ethnographical Survey of the United Kingdom,’ a Committee of the British Association, has frequently been brought before the Conference, and I believe that great assistance has been given to it by our Corresponding Societies. The Committee is no longer in existence, but of lasting importance for continued vigilance is that branch of it entrusted with the recording of monuments and other remains of ancient culture. It is rather the preservation than the recording of such remains that is now of greatest importance, and in this most of our societies could help by appointing vigilance committees to report any attempts at vandalism. Much good has resulted from the ‘Ancient Monuments Act,’ but it does not go far enough, being permissive only, not compulsory. At present the most pressing need of protection seems to be that of Kent’s Cavern, near Torquay, in the exploration of which Mr. William Pengelly spent the best years of his life, and an endeavour should be made to get it placed under the protection of this Act, if a prehistoric cave can be considered a monument, or under the National Trust. I visited it last autumn and found that the custodian had relics for sale.”

Mr. Hopkinson then spoke of Afforestation under Section M, Agriculture, as follows:—

“In the heart of the New Forest there is, or was last summer, a small Portuguese colony, its home a hut in a valley, its handiwork a large gap in the adjoining woodlands. In five weeks 26 men cut down and prepared for use in the trenches in France, 26,000 pine trees. Not far off, Irishmen, and soldiers called up but found unfit for foreign service, had then cleared some 300 out of 450 acres of Scotch fir. These are only two of several lumber camps in various parts of the forest where saw-mills have been set up worked by Canadian and English sawyers. This depletion of forests is going on in various parts of the United Kingdom; I have seen whole mountain sides in Wales so depleted, while little is being done to replenish them. Afforestation on a very large scale will be necessary on the conclusion of the war unless we are content to let our country become an arid waste. There is plenty of land available, unfit, or nearly so, for agriculture, but few will go to the expense of planting trees which may yield no return during their lifetime. No return can be expected for thirty years or so, and it may be sixty or seventy

years before the profit overtakes the original cost with, say, five per cent. per annum compound interest. Moreover the planting must be done on too large a scale for private individuals, however wealthy and patriotic, to do more than a small fraction of it; it will have to be done by the State. It will not interfere with agriculture, for most work is required in the winter when least is required on the farm, and no valuable agricultural land need be taken. As with agriculture there will be men for the work, soldiers returned from abroad who will not go back to sedentary occupations.

“ In walking over the Welsh hills I have repeatedly come across roots and stumps of trees in the peat-mosses which frequently cover them; they are evidences of former forests. The land is worthless except for the value of the peat, the removal of which would, for its valuable products, not only as a fuel, well repay the expense, and the ground would be rendered suitable for planting coniferous trees. It is true that most of our peat-covered mountain land is above the elevation at which it is generally considered that trees will flourish (1,500 feet), but if they did so in the past there seems no reason why they should not do so in the future, for it is far more likely that our climate has become warmer since trees grew on that land than it is that it has become colder. We have also large areas of waste land at lower elevations, extensive slopes which are too steep for ordinary cultivation between, and on sheep farms much very poor grazing land which would be more profitably used in growing timber. As to the best trees to be planted at different elevations and on different soils, at least by private landowners, no doubt there are many botanists in our societies who could greatly help with their advice. In the last half-century we have doubled our imports of timber and now do not produce more than a tenth part of our requirements, although our climate is admirably suited to the production of nearly the whole.

“ We are far behind most European countries in the relative area of our timbered land. For instance, nearly half the area of Russia and of the Scandinavian countries is wooded, about 26 per cent. of the area of Germany, about 17 per cent. of that of France, and the same of Belgium, the most densely populated country in Europe until its devastation and depopulation by the Germans, but only about four per cent. of the area of the United Kingdom, which will probably be

reduced owing to the requirements of our war to not more than two or three per cent.

"Next to fostering agriculture let it be your aim, individually as well as collectively in your capacity as members of societies working in harmonious co-operation, to promote to the best of your ability the re-afforestation of our country. By encouraging these two industries you will help to secure its future safety and prosperity.

"I hope that I have given, for a single address, a sufficient number of examples of good work done by our Corresponding Societies in the past and a sufficiency of hints of what our aims should be in the future. I will only add that it should be the chief aim of each of us

‘To make the world within his reach
Somewhat the better for his being
And gladder for his human speech.’"

After acknowledging the vote of thanks tendered to him, the President suggested the establishment of a National Arbor Day, and the suggestion was fully approved by all the Delegates. The Presidential Address scarcely did justice to Geography; to mention only one point, little was said about Regional Surveys, which are mainly based on Geography.

Mr. C. C. Fagg, the introducer of the first subject for discussion, which was on "Regional Surveys," made ample amends for this neglect. He first explained in detail the way the Croydon Natural History and Scientific Society was making a Regional Survey of the Croydon District, using sheets of the one-inch Ordnance Survey Map to record the observations.

After referring to the work done by the South-Eastern Union of local Scientific Societies, he dealt with the Regional Survey Committee, which had already arranged five annual gatherings in different localities, where regional survey work was commenced, leaving it to be continued by the local society or societies interested. The localities already visited are: Edinburgh, Dublin, Aberystwyth, Ludlow, and Newbury; and it is proposed to visit Lincoln next Easter. Three leaflets dealing with regional survey have so far been issued, the authors being Prof. Fleure, C. B. Fawcett and Geo. Morris. The Committee, which it is intended to convert into an Association, hope in time to arrange for a Regional Survey Museum in each centre.

During the discussion mention was made of the Civic Survey which is being carried out in different centres of the country; at present three—London, South Lancashire (Manchester), South Yorkshire. These surveys will be of great assistance to town planning on right lines.

The second discussion was opened by Mr. T. Sheppard, F.G.S., Hull Museum, on "Weights and Measures." He dealt very briefly with the proposed adoption of the metric system, with which he fully approved, and spoke more in detail of some of the disadvantages of the present system and of some of its difficulties, especially in the former days. He described more particularly the money scales and weights, which were in everyday use 150 years and so ago, in fact, no money transaction was possible without their use. He had been able to make a collection, so far, of almost 300 of these scales, and it was practically the only collection in the country.

The discussion was mainly on the advantages of the Metric System, though the opinion was expressed by Dr. Bather and other speakers that the duodecimal system would be the ideal system, one great advantage being that it provides for division into halves, thirds and quarters, but, like many ideals, it does not seem to be attainable.

The third discussion was opened by Mr. W. M. Webb, with a paper which was a continuation and expansion of the President's address, more particularly with regard to after war possibilities.

The proposal to acquire Kent's Cavern for the public was mentioned, and as it seemed difficult at present for the Government to move in the matter, three of the delegates (Messrs. W. Whittaker, W. Mark Webb and Mark L. Sykes) were requested to make enquiries, and with the support of various societies interested to make an appeal to the public or take such steps as seemed most advisable to attain the desired object.

The proceedings terminated with a joint meeting of the Delegates and of the members of the Selborne Society to hear an address by Professor R. A. Gregory on "Popular Science Lectures." The conclusion come to was that very little action was possible in this matter until after the war, but that then there would be great need for action by all the societies and by various public bodies.

Reviews.

“Warwickshire.” By J. Harvey Bloom, M.A. With Maps, Diagrams and Illustrations. (Cambridge County Handbooks). Cambridge: At the University Press, 1916.

This excellent little book illuminates in more than a score of ways the treasure-trove of the county of Warwick. Of but 144 pages, it would lay no claim to an exposition encyclopedic. But that it is comprehensive and concise is beyond question. It is something to digest before opening a guide book to the county. Then you would know the country, and only need guidance in and through it. Its illustrations in themselves convey to the mind a picture of the character and lay of the land, its historic buildings and relics, its architecture, its cathedrals and churches, its mansions and notable educational institutions; its geology; its agriculture—and more. And last, though by no means least, its great literary associations. Inseparable from it is the name of Shakespeare, upon which no need to dwell. And little less, that of one of the greatest of English novelists, Marian Evans, or as she is better known, George Eliot, so much loved and adored, the local colour of whose novels has provided us with many a pilgrimage. If this little book had done no more than accentuate the literary attractions of the county, it would have justified its being. But enough. Its cost is but 1/6. Bought or borrowed, it should be read. We have mentioned its illustrations. Though generally good, they are somewhat varied in quality; and often we would wish for better composition. Instead of dependence upon photographers here and there, as we are told it has been, we think it would have been worthier the object, and justified itself, to have pursued the pictorial side singly and definitely. But of course after all, the pictures are merely subsidiary. The main purport of the book, to know Warwickshire, is achieved. Rapid train travel has almost obliterated the counties; only certain places of them figuring in the mind, the general characteristics no longer being dominant, if existing. At least it is well to have such an impression of each of them as this little book conveys of Warwickshire. W. H. W.

“Vicente Añes Pinçon.” By James Roxburgh McClymont, M.A. (150 Copies printed)). London: Bernard Quaritch, 1916. (10/6 net.)

Mr. McClymont, in this volume, of 80 pages, gives a very interesting account of the principal voyages in which Vicente Yañez Pinzon, as his name is usually given, is known to have been engaged.

He is well known as the discoverer of Brazil, and it is claimed that he was the first to ascertain that Cuba was an island, and not an extension of the mainland, as Columbus always believed it to be.

Half the volume consists of extracts from unpublished official documents, which explain and support many of the statements made by Mr. McClymont in this biography of one of the “Companions of Columbus,” who does not seem to have had justice done to him by Washington Irving.

All interested in the discovery of the New World will appreciate this result of Mr. McClymont’s study and research, which corrects many of the details of the voyages and life of Vicente Pinzon, as given by previous authors.

Annual Meeting, 1917.

The 32nd Annual Meeting of the Society was held, by kind permission, in the Town Hall, Manchester, on Friday, May 11th, 1917, at 3-0 p.m.

Mr. E. W. Mellor, J.P., F.R.G.S., Vice-President of the Society and Vice-Chairman of the Council, presided.

The following members and friends attended :—The Rt. Rev. Bishop Welldon, D.D., Mr. F. Zimmern, F.R.G.S., Mr. J. E. Balmer, F.R.G.S., Miss Blanchoud, Mrs. Charnock, Miss A. E. Law, Miss Kate Qualtrough, F.R.G.S., Mrs. Stordy, Miss M. E. Tinker, Mrs. Wilkinson, Messrs. E. Barlow, W. S. Buckley, C. A. Clarke, W. J. Dean, T. A. Edwards, F.R.G.S., J. Howard Hall, J. Holm, J. R. Ragdale, C.A., J.P., S. Smith, Harry Sowerbutts, A.R.C.Sc., T. W. Sowerbutts, F.S.A.A., R. A. Staniforth, R. Stewart, T. F. Wilkinson and others.

Apologies were read from : The Rt. Hon. the Lord Mayor (Alderman Thos. Smethurst), Mr. Harry Nuttall, M.P., F.R.G.S., Captain W. C. Bacon, and Mr. Geo. Thomas, J.P.

The Minutes of the 31st Annual Meeting, held on May 12th, 1916, were taken as read, a full Report having appeared in the "Journal," Vol. XXXII, page 114.

The following Annual Report and Balance Sheet were submitted by the Secretary :—

REPORT OF THE COUNCIL.

FOR THE YEAR ENDING DECEMBER 31ST, 1916.

THE Council have pleasure in reporting that, notwithstanding the national crisis, the work of the Society has been carried on with a great measure of success during the year.

The weekly meetings held during the winter months have been fairly well attended, and the Council desire to express their thanks to all those who have given valuable help.

The interesting and instructive character of the lectures delivered will be seen from the following list :—

"The Picturesque Side of a Great City (Manchester)." Mr.

JAMES SHAW, F.R.P.S.

- "Haunts and Homes of the Lancashire Witches." Mr. EWIN PICKSTONE.
- "In the Heart of the Pennines." Rev. A. W. FOX, M.A.
- "Picturesque Yorkshire." Mr. FRED EASTWOOD.
- "Glorious Devon." Mr. LEVI POWELL.
- "Cornish Scenery and Romance." Rev. J. H. BURKITT.
- "Truth and Tradition in Tyrconnell." Rev. A. W. FOX, M.A.
- "A Visit to Lisbon." Mr. FRED EASTWOOD.
- "Siberia and Some Siberians." Miss CZAPLICKA, F.R.A.I.
- "Life in Ladak." Rt. Rev. Bishop HANLON.
- "War: a Preserver of Chinese Art." Mr. JOHN HILDITCH, M.R.A.S.
- "Fujiyama: the Matchless Mountain of Japan." Rev. WALTER WESTON, M.A., F.R.G.S.
- "Nigeria." Mr. W. E. B. COPLAND-CRAWFORD, F.R.G.S.
- "My Thousand Miles along the Great Slave Route (Portuguese West Africa)." Mr. JOSEPH BURTT, F.R.G.S.
- "Twenty-three Years among Central African Tribes." Rev. A. B. FISHER, M.A., F.R.G.S.
- "A Tour in Eastern Canada." Rev. J. G. MAUDE, M.A.
- "The Possibilities of Remoter Canada." Rev. F. C. SMITH, M.A., F.R.G.S.
- "Glimpses of Life and Scenery in the Middle and Far West (U.S.)." Mr. S. W. WILLIAMS, C.A.
- "Geographical Progress of the last Half Century." Mr. J. SCOTT KELTIE, LL.D., F.R.G.S.
- "Coast Lines: a Study in Geography." Mr. A. WILMORE, D.Sc., F.G.S.
- "The Story of a Water Drop." Mr. A. WILMORE, D.Sc., F.G.S.
- "The Gulf Stream and the Weather." Dr. JAMES JOHNSTONE.
- "Weather and Weather Recording." Mr. H. NORMAN EDGE.
- "The Spell of the Mountains." Mr. J. ERNEST PHYTHIAN.

These addresses were delivered in the Geographical Hall, with the exception of the lecture given in the Whitworth Hall by Miss M. A. Czaplicka, F.R.A.I., on "Siberia," at a joint meeting of the University and the Society.

The Journal for 1915 has been issued during the year as an annual volume (Vol. xxxi).

Valuable additions to the Library and Map Collection have been made during the year, full particulars of which are given in the Journal.

The first 30 Volumes of the Mr. and Mrs. Eli Sowerbutts' Memorial deserve special mention.

In accordance with the condition accompanying Mr. W. Booth Leech's valuable gift of 159 West African Books, a card Catalogue of the Library has been completed, and is available for the use of the members. This is in addition to a card index of the chief papers in some of the Exchanges, which was already in use.

The services so freely given by the Victorians in lecturing are greatly esteemed.

The Council greatly deplore the loss by death of the following members :—

Mr. W. A. Arnold.

Mr. F. Ashworth, J.P.

Mr. W. V. Blaikie.

Mr. J. K. Bythell, J.P.

Rt. Hon. J. F. Cheetham, P.C.

Miss E. Crowther.

Mrs. Gumbrell.

Alderman T. Hassall, J.P.

Mr. Harry Herd.

Mr. H. Janus.

Capt. W. Morton Johnson, F.R.G.S.

Mr. Ivan Levinstein.

Mr. J. Howard Reed, F.R.G.S.

Councillor Sir S. W. Royse, J.P.

Mrs. Eli Sowerbutts.

Mr. Joel Wainwright, J.P.

Colonel Sir C. M. Watson, K.C.M.G.

Mr. Ziba A. Ward.

Mr. S. W. Williams, C.A.

Messrs. W. A. Arnold and F. Ashworth, J.P., were Original Members.

The Council deeply sympathise with those members who have suffered bereavement by the death of their relatives in the war.

The following Members of the Society are now serving, or have served in His Majesty's Forces :—

Colonel E. W. Greg, J.P., C.C., F.R.G.S.

Colonel S. L. Mandleberg, J.P.

Major A. England, R.A.

Major P. K. Glazebrook, M.P.

Major E. Johnson, J.P.

Major E. Keith Roach.

Captain W. Morton Johnson, F.R.G.S. (Killed in action).

Captain L. E. Mather, F.R.G.S.

Captain G. R. Mellor.

Captain Norman Zimmern.

Lieut. C. V. Groves, R.N.

Lieut. Wm. Robinow.

Lieut. G. R. Swaine.

Sub-Lieut. H. C. Handcock, R.N.R.

Sergeant H. Shorrocks.

Dr. Edgar Grey.

Mr. F. Clay.

Mr. Harry Herd (died during training).

Mr. Arthur Holt.

Mr. B. Jordan.

Mr. E. Lightowler.

Mr. Charles Sutton.

Mr. A. W. Wood.

Mr. W. D. Woods.

The Council will be pleased to receive intimation of any omissions from this list.

The Balance Sheet for the year, with the Report of the Honorary Auditor, is appended.

It will be seen that there is a small deficiency on the Revenue Account for the year.

The financial position of the Society has been improved by two generous donations:—First, by the gift of £100 by Councillor Edwin Schofield, J.P., from the estate of the late Miss E. Crowther, of Altrincham, in accordance with her request shortly before her death; and also by the gift of a few of the Members, as a Memorial to the late Mr. and Mrs. Eli Sowerbutts, of 15 shares of £10 each in the Manchester Geographical Society Building Company Ltd., together with £8 17s. 11d. in cash to be used for additions to the Library.

The number of members on December 31, 1916, was 648, being a net decrease of 38 during the year.

Additions to the membership are urgently needed to take the place of members who have had to withdraw owing to the war, so as to enable the work of the Society to be carried on as efficiently as possible.

YEAR ENDING DECEMBER 31st, 1916.

NOTE.—The Furniture, Fittings, Books, Maps, Lanterns, Slides, Stock of Journals, etc., which are insured for £1,000, are not included as Assets in the Balance Sheet. There are 48 Life Members (of whom one is Honorary), and the subscriptions of 28 of this number have been taken as revenue in years prior to 1908.

NOTE.—The Furniture, Fittings, Books, Maps, Lanterns, Slides, Stock of Journals, etc., which are insured for £1,000, are not included as Assets in the Balance Sheet. There are 48 Life Members (of whom one is Honorary), and the subscriptions of 28 of this number have been taken as revenue in years prior to 1908.

BALANCE SHEET, DECEMBER 31ST, 1916.

LIABILITIES.		ASSETS.	
	£ s. d.		£ s. d.
To Sundry Creditors	46 4 6	By 166 Shares of £10 each fully paid in the	
„ Subscriptions Paid in Advance	22 1 0	M.G.S. Bldg. Co. Ltd. as under :—	
„ Life Membership Reserve Account	199 10 0	110 Shares presented.....	1,100 0 0
„ Investment Depreciation Account	461 5 0	56 Shares purchased	191 5 0
„ Kirkpatrick Endowment Fund	50 0 0		1,291 5 0
„ To Eli and Emma Soverbutts Memorial Fund :—		„ Subscriptions in Arrear	15 4 6
Shares in Building Co.	150 0 0	„ Cash in Bank	17 3 5
Cash for purchase of Books.....	8 17 11	„ Cash in Hand	7 19 3
Less Amount Expended	2 7 6		25 2 8
	6 10 5	„ Income Tax Recoverable	2 2 4
„ Balance as at December 31, 1915	389 4 2		
Add Donation, late Miss Crowther ...	100 0 0		
	489 4 2		
Less Deficiency for 1916 16 0 7			
Less Transfer to Inv. Depn.			
Account	75 0 0		
	91 0 7		
	398 3 7		
	£1,333 14 6		£1,333 14 6

I have audited the above Balance Sheet and certify the same to be correct. I have inspected the Certificates for the Shares in the Building Company.

27th April, 1917.

THEODORE GREGORY, F.C.A.,
Honorary Auditor.

Mr. E. W. Mellor explained that the Lord Mayor was unable to preside, because he had to go to London to take part in the good and proper function of presenting the freedom of the City of Manchester to General Smuts. Unfortunately, the President of the Society was also detained in London, by his Parliamentary work. He had, however, been so good as to send his annual presidential address, which would be read by the Secretary. Referring to the Annual Report, Mr. Mellor said that if they looked at the figures on the revenue account they would see that, all things considered, they were very satisfactory. The Council had been as economical as possible in managing the affairs of the Society. The Society was suffering from a lack of its usual amount of subscriptions; many members were serving with the forces, and during that time their subscriptions were, in most cases, in abeyance.

It would be seen that they had completed the year with a small balance on the wrong side of about £16. Two very generous donations had been received during the twelve months. At the end of next year the deficiency would probably be increased, and then would be the time for them to make a special effort.

Mr. Harry Nuttall, M.P., F.R.G.S., the President of the Society, in his address, which was read by the Secretary, said: We have suffered severely by the death of many prominent members. I may mention Mr. Bythell, to whom Manchester owed so much for his work in connection with making Manchester a seaport and in the subsequent development of our waterway to the ocean for large ships, a highly important geographical change made by local genius and enterprise; Sir S. W. Royse was another well-known member, and Mr. Joel Wainwright was one of the earliest supporters of our Society, and we all remember his genial personality. Mrs. Sowerbutts, who regularly attended our meetings as long as she was able to do so, has also passed away at a ripe age. Mr. J. Howard Reed was, I think, our most active member after our lamented Secretary, Mr. Eli Sowerbutts. We shall miss Mr. Reed with all his enthusiasm in the cause of geography and for all the educational work he did. You will see in the Report that we have founded a memorial of the late Mr. and Mrs. Eli Sowerbutts. Twenty-one of our members have joined the Army, and one, Captain Morton

Johnson, has given his life for his country. All honour to his memory.

The Society has displayed its usual activity in forwarding the cause of Geography; 24 lectures have been given, the library had been added to and our collection of maps has been increased. Our accounts, considering the times we are passing through, may be considered satisfactory, showing a deficit of only £16, but as we have lost 38 members I imagine they will show a worse result next year, unless we secure more new members. We have now 648, and I venture to repeat that our constant aim should be 1,000 members, so as to enable us fully to develop our work.

Turning to geographical questions, Mr. Nuttall continued : When we met twelve months ago we were anxiously awaiting news of Sir Ernest Shackleton's Antarctic Expedition, and hoping that he had been successful in crossing the Continent from the Weddell Sea to the Ross Sea. In this object he was disappointed, but he has increased our knowledge of the South Polar Regions, and he and all the members of the expedition have displayed a high courage and an endurance under great hardship which illustrate and illumine that noble spirit of self-sacrifice which has made our Empire so great and helped so much in the progress of the world. On December 6th, 1914, the expedition left South Georgia, and on January 10th, 1915, sighted Coats Land, and traced 200 miles of new coast line, which was named the Cairn Coast. An abnormally cold season made it impossible to land in the Weddell Sea, and the "Endurance" drifted there during the ensuing winter. The vessel was crushed in the ice and abandoned on the 27th October, 1915. Our heroes were camped on the ice five months. On the 16th April, 1916, the ice broke up, and they took to the boats, fought through heavy seas and drifting ice to the South Shetland Islands, where they landed on Elephant Island, and found their only shelter in an ice cave. Twenty-two men were left there under Mr. Frank Wild, a most notable figure in Antarctic exploration, this last being, I believe, the third expedition of which he has been a member. On the 20th May, Sir Ernest Shackleton and five volunteers started, a forlorn hope, for succour on a perilous voyage in a 22 foot boat in the Southern winter, and reached South Georgia. Three relief expeditions organised by Sir Ernest failed, and a British expedition was

in course of preparation when the Chilean Government lent a steamer with which Sir Ernest succeeded in reaching his distressed companions on the 30th August, 1916. They had all suffered from the exposure and lack of food, both during their five months on the ice and in the subsequent three months on Elephant Island. The courage and skill with which Sir Ernest, after the loss of his ship, brought every man safely back, is a wonderful example of unselfish heroism, and he is now on his way back to England from Australia to offer his services in the war. You will remember that ten men of the supporting expedition to the Ross Sea were left in the Antarctic in May 1915, through the "Aurora" being blown away by violent storms. The "Aurora" started again from Australia for the Ross Sea on December 20th, 1916, and rescued seven of the survivors on the 19th of January last. We have to deplore the loss of Captain Macintosh, Mr. V. C. Hayward and the Rev. A. P. Spencer. Sir Ernest Shackleton had reached Australia and accompanied the relief expedition. The return of the Shackleton Expedition is the great outstanding event of the geographical year.

The Arctic expeditions of Mr. Stefansson and Prof. Macmillan are still in operation. Miss Mary Jobe has made a new expedition to the Northern Rockies, and ascended to within 200 feet of the summit of the great peak known provisionally as Mount Alexander. A French explorer, Commander Lofler, after an interval of 45 years since Nachtigal's visit, has supplied an important report from Tibesti in South Central Sahara. The interesting problem, in this part of Africa, is presented of a possible connection between Lake Tchad and the Nile by the now dry channel of the Bahr-el-Ghazal. Exploration is not yet completed.

Railway development in Africa has made some progress. The Uganda line has been linked with the German line at Moshi, and in Tunis and Nigeria extensions have been carried out. The locomotive is a great forerunner of trade.

American explorers have been active in many parts of South America; particular mention should be made of Dr. Farabee, who has completed three years' exploration in the Amazon region.

This, unhappily, is our third meeting since the beginning of the Great War, which is still raging with unabated fury and causing unparalleled suffering and loss of life.

We have two tremendous issues before us. Either we must completely overthrow the aggressive domination of armed force, and found a League of Nations to maintain the peace, or, in the event of an incomplete result, armed forces will have to be maintained on a larger scale than before the war, with the resulting impoverishment and retrograde course of the history of mankind. We pray for the victory of right over might, and that the movement in which the United States is leading to combine together the nations who believe in the government of the world by justice and law, may grow in strength and influence and become the ruling and controlling power.

Last year I referred to the great undeveloped resources of Russia, Africa and China, and we may include our own colonies, especially Canada. Regarding the last-named, a cable has been received by the High Commissioner for Canada stating that the arable lands of Canada are capable of producing foodstuffs to supply the requirements of all the warring countries of Europe, and that the big grain crop of 1915 was gathered from less than 10 per cent. of the arable land of the Dominion. The liberation of Russia will add greatly to the productiveness of her vast territories, not only for her own benefit but for the benefit of other nations.

Great ethnological changes will arise out of the war which has brought nearer to each other the old world and the new, and this, together with the growing rapidity of communications in every direction, makes the human race more of one family whose interests will have to be dealt with, to a larger extent than ever in the past, as one interdependent problem. Our growing brotherly friendship and unity of aims with those of the United States will also help forward the great advance, and with tyranny overthrown we may yet see a better a more just and prosperous era than mankind has ever secured since the dawn of civilization.

Mr. E. W. Mellor having formally moved that the Annual Report and Balance Sheet be received and adopted, the Right Rev. the Dean of Manchester (Bishop Welldon) seconded the resolution, which was carried unanimously.

The Dean said that he thought the Society might congratulate itself upon a successful year. It was very difficult to carry on the operations of that or any other society during war, but he had no doubt that the war would excite a very much larger and keener interest in geographical questions

than ever existed before. Think what effect the war must have upon hundreds of thousands of Englishmen who, for the first time, were brought to personal knowledge of countries lying far from their own country! This was partly realised when one conversed from day to day with wounded soldiers from all parts of the battle fields. One of the men nursed in his own house told him he had been wounded in the Garden of Eden! It was quite impossible that these men and those influenced by them should not entertain a larger appreciation of geographical study than ever before. Some far-seeing Germans were drawing maps of parts of the world after the war. That seemed a rather perilous occupation. He was not sure whether it would be safe to draw a map of Germany after the war, but the salient fact remained that the whole of the German Colonial Empire had disappeared or was about to disappear, and he did not think it would be restored.

"This Society, which represents the interests of geography in Manchester," concluded Bishop Welldon, "may go its way in the sure confidence that it is playing a useful part now, and will play a still more useful part when the war is over. I cannot dissociate the thought of Manchester and the thought of nations all over the world in respect of commerce and in respect of research. I hope very much that new members will be brought into the Society, so that, when the war is over, the Society, with enhanced means and increased power, may do its work of assuring that Manchester, in virtue of its world-wide trade, shall be one of the foremost cities in the support of geographical research the whole world over."

The Secretary read the nominations for Officers and Council, including three new Vice-Presidents and four new members of the Council; one nomination for Vice-President was Mr. J. E. Balmer, F.R.G.S., who had been a member of the Council for 24 years, so they thought it was quite time he was raised to a higher position. The other two nominations for Vice-Presidents were Captain W. C. Bacon, the Chairman of the Ship Canal Company, and Mr. R. B. Stoker, F.R.G.S., the President of the Chamber of Commerce. The four new members proposed for the Council were Miss Kate Qualtrough, F.R.G.S., Mr. T. A. Edwards, F.R.G.S., Mr. J. R. Ragdale, C.A., J.P., and Mr. R. A. Staniforth.

Mr. S. Smith moved that the Officers and Council as

nominated be elected, and that the retiring Officers and Council be thanked for their services. Mr. R. Stewart seconded the resolution, and it was passed. (See List of Officers and Council with the title-page.)

Mr. T. W. Sowerbutts, F.S.A.A., proposed : " That the best thanks of the Society be given to Mr. Theodore Gregory, F.C.A., J.P., for his services as Honorary Auditor, and that he be re-elected." This was, he observed, the thirty-second annual appointment of Mr. Gregory to this post. He had been with them from the beginning, and was one of their firmest friends. Mr. J. Howard Hall seconded the motion, which was agreed to.

Mr. J. E. Balmer, F.R.G.S., moved : " That the best thanks of this meeting be tendered to the Right Hon. the Lord Mayor for the use of this Hall, and to Mr. E. W. Mellor for presiding over the meeting." Mr. R. A. Staniforth seconded the resolution, which was carried with acclamation.

Mr. E. W. Mellor, responding, said that he would have great pleasure when he saw the Lord Mayor in saying to him how grateful they were for the use of the Hall. Personally, it was a great pleasure to him to do anything he could for the Manchester Geographical Society.

He hoped that if those present knew any friends who were likely to become members they would, for the sake of the Society, induce them to join. Membership of the Society was not a bad investment, and for the annual subscription members got a good return in all the lectures and in the Journal, which was issued with a certain amount of regularity. Of course, during war time they had not been able to issue as many Journals as before, and it took a little bit of scheming to run the Society and to make ends meet. But if members helped their utmost he thought that the Society would flourish in the future as in the past.

Proceedings of the Society.*

January 1st to December 31st, 1917.

The 1,031st Meeting of the Society was held on Tuesday, January 9th, 1917, at 7.0 p.m. Mr. George Ginger presided.

Mr. J. E. Phythian gave a lecture on "Constantinople: a Romance of History," and concluded by describing a large number of fine slides, which were shown.

The Meeting concluded with a hearty vote of thanks to the lecturer.

The 1,032nd Meeting of the Society was held on Tuesday, January 16th, 1917, at 7.0 p.m. Mr. E. W. Mellor, J.P., F.R.G.S., presided.

Mr. Samuel Wells, F.R.G.S., gave a lecture on "Greece: Before and During the War," and illustrated his remarks with lantern views from his own photographs.

A hearty vote of thanks was accorded to the lecturer.

The 1,033rd Meeting of the Society was held on Tuesday, January 23rd, 1917, at 7.0 p.m. Mr. George Ginger occupied the Chair.

The election of Mr. Edmund Rostron as an Ordinary Member was announced.

Professor G. Elliot Smith, M.D., F.R.S., gave a lecture on "Ancient Mariners," illustrating his remarks with a large number of maps and other lantern views. (See p. 1.)

The hearty thanks of the Meeting were tendered to the Professor for his interesting and instructive address.

The 1,034th Meeting of the Society was held on Tuesday, January 30th, 1917, at 7.0 p.m. Mr. Harry Nuttall, M.P., F.R.G.S., presided.

The Rt. Rev. Bishop Mercer gave a lecture on "Tasmania: Australia's Switzerland." The address was illustrated with slides lent by the Agent-General for Tasmania.

On the motion of the President, it was resolved that a hearty vote of thanks be given to the lecturer for his interesting, instructive and humorous address, and to the Agent-General for Tasmania for the use of the slides.

* The Meetings were held in the Geographical Hall, unless otherwise stated, and the Minutes of the preceding Meeting were taken as read.

The 1,035th Meeting of the Society was held on Tuesday, February 6th, 1917, at 7.0 p.m. Mr. T. W. F. Parkinson, M.Sc., F.G.S., presided.

The Chairman announced the election of the following Members: Ordinary, Mr. Walter Burton; Associate, Miss Limebeer; Corresponding, Rt. Rev. Bishop Mercer.

Dr. Albert Wilmore, F.G.S., gave a lecture on "The Structure of the Northern Pennines: A Study in Geographical Evolution." The address was illustrated with diagrams and maps prepared by the lecturer.

A hearty vote of thanks was accorded to the lecturer.

The 1,036th Meeting of the Society was held on Tuesday, February 13th, 1917, at 7.0 p.m. Mr. R. A. Staniforth presided.

Mr. John Hilditch, F.R.A.S., F.R.G.S., gave a lecture on "What I Saw in Old Japan," illustrated with coloured and other lantern views.

The lecturer received the cordial thanks of the Meeting for his interesting account of visits to Japan.

The 1,037th Meeting of the Society was held on Tuesday, February 20th, 1917, at 7.0 p.m. Mr. E. W. Mellor, J.P., F.R.G.S., presided.

The Chairman mentioned the loss by death of Mr. W. J. Tyne, and a resolution of sympathy with his relatives was passed, all present rising in silence in acquiescence.

The Chairman announced the election of Mrs. Robert Innes as an Ordinary Member, and Miss R. M. Law as an Associate.

Miss S. Nicholls, M.A., F.R.G.S., gave a lecture on "The Holy Land Yesterday and To-day," and illustrated her address with many lantern photographs taken by herself, concluding with a number of natural colour slides.

The thanks of the Meeting were voted to Miss Nicholls with acclamation.

The 1,038th Meeting of the Society was held on Tuesday, February 27th, 1917, at 7.0 p.m. Colonel H. T. Crook, D.L., V.D., presided.

The Chairman mentioned the loss by death of Alderman W. T. Heap, J.P., of Rochdale, who had supported the Society for twenty-eight years, and a resolution of sympathy with his relatives was passing by all rising in silence.

A series of slides in illustration of some special gifts to the Library were shown, commencing with the book plate designed by the late Mr. Joel Wainwright for the 1,500 volumes bequeathed by the late Mr. Eli Sowerbutts, F.R.G.S., Secretary and one of the principal founders, then particulars of the 159 volumes presented by Mr. W. Booth Leech, of the 45 presented by Mr. Wm. H. Ward, of the books presented by Miss Kate Qualtrough, F.R.G.S., Mr. George Thomas, J.P., and Mr. Isaac Chorlton were given on

the screen, the two final slides being copies of the two following book plates : "This volume is one of a number of books presented, together with fifteen £10 shares in the Manchester Geographical Society Building Company, Limited, by a few members of the Society 'In Memoriam: Mr. and Mrs. Eli Sowerbutts'"; and, "This volume is one of a number of books presented to the Society by Mrs. Walkden and family 'In Memoriam: Mr. John Walkden,' a member of the Society for many years." The Chairman mentioned that these plates would be inserted in about 70 volumes in each case.

Mr. P. M. Roxby, F.R.G.S., described "Some Impressions of North China," illustrating his remarks with many lantern views from his own photographs.

Mr. Roxby was accorded a hearty vote of thanks.

A short report follows :—

"Mr. Roxby visited China about four years ago in connection with an endowed travelling fund, and as the result of his observation in the course of his travels brought away with him the main characteristics of the people. He was struck among other things with their wondrous vitality and adaptability to climatic conditions, their keen sense of humour, their remarkable skill as agriculturists, and their minds, which were open to reasonable words spoken to them. Mr. Roxby pointed out the immense industrial future that was opening out to the Chinese, a matter which was of special significance to a city like Manchester, and urged the importance of setting ourselves the task of understanding the people to the advantage of both sides." ("Manchester City News," March 3rd, 1917.)

The 1,039th Meeting of the Society was held on Tuesday, March 6th, 1917, at 7.0 p.m. Mr. R. A. Staniforth presided.

The Chairman mentioned the loss by death of Mr. Moritz Kalisch, member for over twenty years, and a resolution of sympathy with his widow and family was passed by all rising in silence.

The election of Mr. Herbert B. Whittle as an Ordinary Member was announced.

Miss M. G. Hindshaw gave an account of "Life in Alaska and the Yukon," dealing most fully with Sitka, where she lived, and its surroundings. The lecture was illustrated with many lantern slides, those of Sitka having been prepared from the lecturer's photographs, and a map slide of Canada was lent by the Canadian Government Agent in London. The Society was indebted to Mr. J. O. Smith for the gift of a wall map of Canada. Miss Hindshaw also had on exhibition a large number of native curios (basket ware, carved paddles and other wooden objects) and photographs.

A hearty vote of thanks was passed to Miss Hindshaw for her lecture, and to the Canadian Government Representative for the maps.

The 1,040th Meeting of the Society was held on Tuesday, March 13th, 1917, at 7.0 p.m. Mr. J. E. Balmer, F.R.G.S., presided.

The Chairman mentioned the loss by death of Madame M. Adnett, Superior of the Sedgely Park Training College, and a resolution of sympathy with the staff of the College was passed.

Mr. T. A. Edwards, F.R.G.S., gave a lecture on "The Coloured Races of South and East Africa," illustrating his remarks with lantern views from his own photographs, and with native curios obtained by him on his journeys.

On the motion of Councillor J. Hislop, seconded by the Chairman, a hearty vote of thanks to Mr. Edwards was passed.

The 1,041st Meeting of the Society was held on Tuesday, March 20th, 1917, at 7.0 p.m. Mr. E. W. Mellor, J.P., F.R.G.S., presided.

Mr. Henry F. Northcote gave a lecture on "How Mountains, Rivers and Valleys came, or, Wales in Bye-Gone Ages." The address was illustrated with a large number of coloured and other lantern slides, including two rock sections and concluding with reproductions of four paintings of Lake Vyrnwy scenery and colour effects.

Mr. Northcote was accorded a very hearty vote of thanks.

The 1,042nd Meeting of the Society was held on Tuesday, March 27th, 1917, at 7.0 p.m. Mr. J. Stephenson Reid presided.

Mr. J. D. Berwick gave a lecture on "Our Own Countryside: By Meadow, Lane and Stream," illustrating his remarks with a large number of beautiful coloured and other slides.

A hearty vote of thanks was given to Mr. Berwick.

The 1,043rd Meeting of the Society was held on Tuesday, October 9th, 1917, at 7.0 p.m. Mr. D. A. Little presided.

The Secretary read the following list of losses by death since the last meeting, and reported that letters of condolence had been sent to their relatives by direction of the Council:—Miss A. H. Woolfenden, Mrs. J. Allen, Sir W. H. Houldsworth, Bart., Alderman J. Frankenburg, J.P., Alderman J. H. Thewlis, J.P., and Mr. E. H. Hamp.

The election of the following Members was announced:—Ordinary: Miss E. Moran, Miss M. Thompson, the Rt. Rev. Monsignor Kelly, Messrs. A. H. Booth, A. Hollas, and N. Jepson; Associate: Miss J. Graham, Miss G. Gawthorpe, Miss V. Long, Miss F. Seafeld Grant, B.Sc., Miss E. Taylor, Miss S. Walshaw, Mrs. M. W. Hall and Rev. M. W. Hall.

Mrs. Brodsky gave an account of the "Russian Revolution and Kerensky."

Colonel H. T. Crook, D.L., moved a hearty vote of thanks to Mrs. Brodsky, and after the Chairman had supported the resolution, it was passed unanimously.

The 1,044th Meeting of the Society was held on Tuesday, October 16th, 1917, at 7.0 p.m. In the Chair, Mr. T. A. Edwards, F.R.G.S.

It was agreed to take as read the Report of the Delegate to the Conference of the Corresponding Societies of the British Association, held in London on July 5th and 6th, 1917. (See page 39.)

The Rev. F. C. Smith, M.A., F.R.G.S., gave an address on "The Internationalization of Mankind," and illustrated his remarks with many lantern views.

On the motion of the Chairman, a hearty vote of thanks was passed to the lecturer.

A report of the lecture by the Rev. F. C. Smith, M.A., F.R.G.S., here follows :—

The lecturer said that in conversation with the Dean of Manchester (Bishop Welldon) on the previous day, he (the Dean) had said we were a long way off from the internationalization of mankind, but the speaker himself thought we might be much nearer to it than we thought. We had only to look back over our own country's history since the days of Boadicea to understand how peoples once opposed to each other by tribal wars and language differences could become merged into one, with common aims and united government.

If we looked at the United States of America we saw a relatively modern case of the merging and "internationalization" of every type of people under the sun. The states represented on a comparatively small scale what would come to pass in the unification of the whole world. The territory of Canada was closely related in this respect with the United States, and men were flocking in thousands across the boundary, carrying with them American democratic ideas in regard to the common brotherhood of all mankind.

The basis of internationalization must rest on character, and not accident of birth, or the chance of geographical boundary. We ourselves were an intensely mixed race, and we had no hatred of a man because he came, say, from Scotland, although we might have prejudices, and, providing a man behaved himself, he was let alone to live quietly in the social circle. That state of things ought to be applicable to the whole world.

One of the great wants was a universal language, and that ought not to present any special difficulty. English was the language common to the use of North America; then there were the African, Australian and New Zealand territories, etc., with the same language. In North Wales English was the covering language, although the Welsh people so extensively used their own native tongue amongst themselves; as Englishmen you could thrust your way into remote places with the use of "Kiswahili," although each tribe had its own speech. With this and other evidence there seemed no reason why a universal language, common to the use of all men, should not weld the world into one in commerce and sympathy.

Another great want was a universal coinage. On landing in Canada, for example, one felt oneself to be a foreigner within our own possession on account of the necessity for money exchange, and the United States were really in organism more closely related to Canada than we ourselves were, through the medium of their money system. Yet another want was international law, which would have such force among the greater and more powerful nations

that it would protect all races from the grasp of injustice. Now each nation or group of nations had laws which were not common to all; the consequence was a world of men in fragments of operation and government.

The lecturer showed many slides, starting with savages marked with indelible marks, to illustrate how men endeavour to leave behind the state of savagery and come into the stream of civilization and ascend the human scale of life. That grouping of men into an international system was very slow, yet the progress had been amazingly swift during the past 100 years. An intelligent half-bred Indian had told him that in fifty years or less every Red Indian would have become absorbed into the white race, and that was the common belief in North America. Such a tremendous fact of race blending was very significant.

It was this race mixing which had been noticed by the lecturer some 27 years ago in East Africa, which originated the thought and title of the lecture in his mind. Whites insisted on marriage with blacks, and the cross results were people corresponding to the West Indian type, some of whom were men of high intelligence and power of bearing responsibility. This cross-breeding was going on all over the world, and blending races just as we were blended in the British Isles. The great factors at work were steam power in ships and railways, which transported people with ease and comfort over vast distances, and caused men of all nations to commingle and blend in thought and action. Telegraphy and telephony led to quick understanding in commerce, and such other directions as promoted the well-being of mankind, and shortly we should have aeroplanes which would greatly link up people who for ages had regarded themselves as opposed by nature.

To think of these things in contrast with the old stay-at-home type of pre-railway days was to think of amazing changes already accomplished and far greater things to come. A republic of all nations might be looked for.

Quite recently General Smuts had referred to "that society of nations which we call or mis-call the British Empire," and it was presumed that General Smuts was thinking of something bigger with a greater name than the insular term "British."

Lord Northcliffe quite recently (October 3, 1917) received the degree of Doctor of Laws from the president of the University of Rochester, U.S.A., who said: "We do not address you as a foreigner; we greet us in consideration of your great work for the British Empire as a comrade, brother, friend, and son."

If that tone of fellowship could be universally set up throughout the world it would be the foundation of an internationalisation of mankind.

We needed to stamp out ignorance of others and race prejudice, and although the ideal was only now dimly seen, yet it would grow into shape and form as the details of an advancing ship loom out through a sea fog.

The chairman, Mr. Edwards, F.R.G.S., who is a wide traveller, expressed the view that the lecturer was perhaps rather too optimistic, judged by our divergent difficulties on politics and economic questions, but the subject was a tremendous one, and the society greatly appreciated the lecture from one who was too well known to the Manchester Geographical Society to need any introduction.

"Sussex County Herald," October 20th, 1917).

The 1,045th Meeting of the Society was held on Tuesday, October 23rd, 1917, at 7.0 pm. In the Chair, Colonel H. T. Crook, D.L., V.D.

The Chairman mentioned the loss which the Society had suffered by the death of Colonel Jesse Pilcher, V.D.

The election of the following members was announced :—Ordinary : Mrs. Clara Brooks, Miss E. L. Farran, Messrs. J. C. Crofts, R. Martin and B. Campbell ; Associate : Miss E. Bridge, Miss E. Porritt, Miss A. L. Redford, Miss M. Richardson, Miss J. Shaw, Miss L. Whittle, Messrs. O. Hoole and R. Leather.

The Chairman, on behalf of the Society, thanked Mr. James Williams for the gift of Paul Marcoy's book of " South America," in four volumes, for the Library.

The Rt. Rev. Monsignor Kelly gave a lecture on " Spain." At the conclusion of the lecture the lecturer described a number of lantern slides which were shown.

The hearty thanks of all present were voted to the lecturer.

The 1,046th Meeting of the Society was held on Tuesday, October 30th, 1917, at 7.0 p.m. In the Chair, Mr. E. W. Mellor, J.P., F.R.G.S.

Miss E. L. Broadbent, M.A., of the Scottish Women's Hospital Unit, described " Travels on the Russo-Rumanian Front," and illustrated her remarks with lantern views.

It was unanimously resolved, on the motion of the Chairman, that the hearty thanks of the Meeting be given to Miss Broadbent.

The 1,047th Meeting of the Society was held on Tuesday, November 6th, 1917, at 3.30 p.m. Mr. J. E. Balmer, F.R.G.S., presided.

The Rev. A. W. Fox, M.A., gave a lecture entitled, " In County Cork," illustrated with a large number of lantern views.

On the motion of the Chairman, a hearty vote of thanks was passed to the lecturer.

The 1,048th Meeting of the Society was held on Tuesday, November 13th, 1917, at 7.0 p.m. Mr. J. Stephenson Reid presided.

The election of the following members was announced :—Ordinary : Sir H. A. Miers, D.Sc., F.R.S., Councillor R. W. Shepherd, Messrs. John Shaw and Richard Urmston ; Associate : Miss R. J. Renshaw.

Mr. Arthur A. Bellingham gave a lecture on " Architectural and Historical

Associations of our Cathedrals," illustrated with a large number of lantern views.

The lecturer was accorded a hearty vote of thanks.

The 1,049th Meeting of the Society was held on Tuesday, November 20th, 1917, at 3.30 p.m. In the Chair, Mr. R. A. Staniforth.

The Chairman read an invitation to the Members of the Society to attend a Meeting of the Manchester Branch of the Geographical Association to be held at 6.0 p.m. on Friday, November 30th, when Prof. P. M. Roxby would lecture on "Some Geographical Aspects of the Frontier Problem in Europe."

Mr. H. F. Northcote gave a lecture on "The Earth and its Ice-clad Poles," with special reference to South Polar conditions. The address was illustrated with many lantern slides, including some reproduced by kind permission of Sir Ernest Shackleton and a number of hand-painted slides. Mr. Northcote concluded by explaining the theory that the Magnetism of the Earth is due to Electricity emanating from the Sun.

A hearty vote of thanks was passed to Mr. Northcote for his interesting and instructive lecture.

The 1,050th Meeting of the Society was held on Tuesday, November 27th, 1917, at 7.0 p.m. Colonel H. T. Crook, D.L., J.P., presided.

Mr. John B. Gass, F.R.I.B.A., J.P., gave a lecture entitled: "In Greece and on Some of the Islands in the Ægean Sea." (See page 31.) He illustrated his address with over 60 water-colour sketches, and at the conclusion a collection of lantern slides kindly lent by Mr. Youatt were shown.

A hearty vote of thanks was passed to Mr. Gass for his interesting lecture and for the sketches and to Mr. Youatt for the loan of the slides.

The 1,051st Meeting of the Society was held on Tuesday, December 4th, 1917, at 7.0 p.m. In the Chair, Mr. George Ginger.

Mr. Arnold Williams, A.C.A., gave a lecture on "The Growth of the British Empire during last Century—Economic." The address was illustrated with many lantern slides of maps, diagrams and views.

On the motion of the Chairman a hearty vote of thanks was passed to Mr. Williams.

The 1,052nd Meeting of the Society was held on Tuesday, December 11th, 1917, at 7.0 p.m. Mr. J. Stephenson Reid presided.

The Rev. J. H. Burkitt gave a lecture entitled: "Round about Lake Geneva and Chamonix." The address was illustrated with many fine lantern views.

On the motion of the Chairman, a hearty vote of thanks was passed to the lecturer.

The 1,053rd Meeting of the Society was held on Tuesday, December 18th, 1917, at 6.0 p.m., when the Annual Lecture to the children of members and friends was delivered. Mr. E. W. Mellor, J.P., F.R.G.S., presided.

The Rev. J. H. Burkitt gave a lecture on "The Snowclad Alps," and illustrated his instructive and amusing address with a large number of very fine lantern views.

The children gave evidence of their appreciation by rounds of hearty applause.

List of Maps, Books, Journals, etc.,

ACQUIRED BY THE SOCIETY
FROM JANUARY 1st TO DECEMBER 31st, 1917.

Maps.

- New Map of Greater Manchester. Covering an area of 150 square miles. Scale, 6 inches to 1 mile. Manchester: John Heywood, 1885. *Manchester Chamber of Commerce.
- Map of the Borough of Salford. Surveyed by A. Jacob, M.Inst.C.E., in 1879 to 1885. Corrected to 1895 by J. Corbett. Scale, 400 feet to 1 inch. *Manchester Chamber of Commerce.
- Economic Map of the Russian Empire. London: R. Martens and Co., 1917.
- Map of Turkey in Europe and Asia to show proposed Asia Minor and Euphrates Railway. Scale, 50 miles to 1 inch. London: E. Stanford, 1878. *Manchester Chamber of Commerce.
- The Excelsior Map of Asia, by G. W. Bacon, F.R.G.S. Scale, 133 miles to 1 inch. London: G. W. Bacon, 1884. *Manchester Chamber of Commerce.
- Trade Routes from Bhamo to Yunan through the Chinese Shan States. Surveyed and Compiled by Direction of the Chief Commissioner of British Burma. (Signed) Robert Gordon, C.E. Scale, 4 miles to 1 inch. Calcutta: T. Black and Co., 1869. *Manchester Chamber of Commerce.
- The Central and Eastern Provinces of Southern Nigeria, 1910. Compiled by Captain W. H. Beverley. Scale, 1/500,000. London: Edward Stanford, 1910. *Manchester Chamber of Commerce.
- Lagos Harbour. Scale, 1/9,675. London: The Admiralty, 1893. Corrected to 1904. *Manchester Chamber of Commerce.
- Map of Bonny and New Calabar Rivers and Connecting Creeks. Surveyed by Lieut. R. H. W. Hughes, R.N.R., and others. Scale, 1,000 yards to 1 inch. London: Hydrographic Department, Admiralty, 1913. *Manchester Chamber of Commerce.
- Map of the Dominion of Canada. Scale, 58 miles to 1 inch. Issued by direction of the Minister of the Interior. Ottawa, 1915. *Mr. J. Ober Smith, Assistant Superintendent of Emigration for Canada.
- Map of Nova Scotia. Scale, about 8 miles to 1 inch. (A. and W. MacKinley, Halifax). Published by order of the Government. London: George Philip and Son, 1901. *Manchester Chamber of Commerce.
- Pacific Ocean. Showing distances between Ports. London: The Admiralty, 1859. Corrected to 1884. *Manchester Chamber of Commerce.

ATLASES, PHOTOGRAPHS, Etc.

- A New General Atlas of the World. With a Memoir of the Progress of Geography. A Summary of Physical Geography and a Consulting Index. Dedicated to Alexander Keith. Edinburgh: John Thomson and Co., 1817. *Mr. A. Wise, Hungerford, Berkshire.

Calendario-Atlante de Agostini, Anno XIII, Serie II. Vol. III, 1916; Vol. IV, 1917. Con notiziario redatto da Luigi Filippo de Magistris. Novara : Istituto Geografico Agostini. (Price, 1 Lira.) *The Publishers.
New York. 17 Coloured Picture Postcards. *Mr. J. Herbert Cooke.
* Donor.

Books.

GENERAL.

- Land, Sea and Sky, or, Wonders of Life and Nature. A description of the Physical Geography and Organic Life of the Earth. Translated from the German of Dr. Herman, J. Klein and Dr. Thomé, by J. Minshull. Illustrated. London : Ward, Lock and Co. *Miss K. Qualtrough, F.R.G.S.
- Text Book of Topographical and Geographical Surveying, by Colonel C. F. Close, C.M.G., R.E. Revised by Captain E. W. Cox, R.E. Second Edition. Tenth Thousand. Maps. Diagrams. Illustrations. London : H.M. Stationery Office. 1913. (Price, 7/6.) *The Authors.
- Map Reading and Panorama Sketching, by an Instructor. Second Edition, Revised and Enlarged. Illustrated. London : Sifton, Praed and Co. 1917. (Price, 4/6 net.) *The Publishers.
- Reports of the Fourth and Fifth Annual Conferences of Educational Associations held at the University of London, January, 1916, and January, 1917.
- The Geographical Teacher. The Organ of the Geographical Association 1917, Nos. 47, 48, 49. *Mr. H. Sowerbutts, A.R.C.Sc.
- Education, Scientific and Humane. A Report of the Proceedings of the Council for Humanistic Studies. Edited by Frederick G. Kenyon. London : John Murray. 1917.
- Recollections and Reflections by the Right Rev. J. E. C. Welldon, D.D., Dean of Manchester. Portrait. London : Cassell and Co. 1915. *Mr. and Mrs. E. S. Memorial Vol., No. 41.
- The Athenæum Subject Index to Periodicals, 1916. Historical, Political, and Economic Sciences, including the European War, Geography, Anthropology and Folk Lore. Issued at the request of the Library Association. London : The Athenæum. 1917. (Price, 5/- net.) *The Publishers.
- Whitaker's Almanack, 1917.
- The Fortnightly Review. Edited by W. L. Courtney. January, February, March, April, May, June, July, August, September, October, November, December. 1917. *Miss Kate Qualtrough, F.R.G.S.
- The Co-operative Wholesale Societies, Limited, Annual, 1917. *Mr. G. H. Warren.
- Incorporated Accountants. Alphabetical List of Members, Report of the Council, etc. War Edition, 1917-18. *The Council of the Society of Incorporated Accountants and Auditors.
- The War and the Future, by the Right Hon. Sir Robert Borden, G.C.M.G.,

Prime Minister of the Dominion of Canada. Being a narrative compiled from speeches delivered at various periods of the war in Canada, the United States and Great Britain. With an introductory letter to the Compiler, Percy Hurd. Portrait. London: Hodder and Stoughton. 1917. (Price, 2/- net.) *The High Commissioner for Canada.

Colonies et Marine. Année 1, Nos. 1, July; 2, November. Paris. 1917. *The Publishers.

An Appreciation of the British Empire by the Allies. Illustrated. London: Country Life, Christmas Number, 1916. *Miss K. Qualtrough, F.R.G.S.

Development of the Cotton Growing Resources of the British Empire. By J. Arthur Hutton. (Cotton Growing Association Publication, No. 64.)

BRITISH ISLES.

The Year-Book of the Scientific and Learned Societies of Great Britain and Ireland: A Record of the Work done in Science, Literature and Art during the Session 1916-1917. London: Charles Griffin and Co. 1917.

The Story of the C.W.S.—The Jubilee History of the Co-operative Wholesale Society, Limited, 1863-1913, by Percy Redfern. Illustrated. Manchester: C.W.S. *Mr. G. H. Warren.

Cook's Handbook to London. Map and Six Plates. London: Thos. Cook and Son. 1915.

Beautiful Surrey. Section 1.—Tadworth and the Highlands of London, by Charles Ford. Map and Illustrations. Second and Revised Issue. Caterham Valley: Gates and Holbrook.

A History of Berkshire, by Lieut.-Col. Cooper King, F.G.S. London: Elliot Stock. 1887. *Mr. and Mrs. E. S. Memorial, Vol. 43.

A History of Hampshire, including the Isle of Wight, by T. W. Shore, F.G.S. London: Elliot Stock. 1892. *Mr. and Mrs. E. S. Memorial, Vol. 42.

A History of Devonshire. With Sketches of its Leading Worthies, by R. N. Worth, F.G.S. London: Elliot Stock. 1886. *Mr. and Mrs. E. S. Memorial, Vol. 44.

A History of Lancashire, by Lieut.-Colonel Henry Fishwick, F.S.A. London: Elliot Stock. 1894. *Mr. and Mrs. E. S. Memorial, Vol. 45.

The Official Handbook of Manchester and Salford and Surrounding District. Manchester: Manchester Corporation. 1917.

History and Traditions of Prestwich, by the Rev. W. Nicholls. With the Geology of the District, by J. R. Ragdale, J.P., C.C. And the Flora of Prestwich, by J. Cosmo Melvill, M.A., F.L.S. Section and Illustrations. Manchester: Albert Sutton. 1905.

The Great World War. Irlam and Cadishead's Part, 1914-1917, by Joseph Cooke. Illustrated. Irlam, 1917. *Mr. George Thomas, J.P.

Burnley Literary and Scientific Club. Transactions. Vol. XXXIV. 1916-17. *Mr. Thomas Foster, Hon. Secretary.

Bibliography of Yorkshire Geology (C. Fox-Strangway's Memorial Volume), by T. Sheppard, M.Sc., F.G.S., F.S.A. (Scot.). Hull: Yorkshire Geological Society, Proceedings Vol. XVIII. 1915. (Price, 15/- net.) *The Author.

The Lost Towns of the Yorkshire Coast, and other chapters bearing upon the Geography of the District, by Thomas Sheppard, F.G.S., etc. Maps, Plans, Sections and Illustrations. Hull: A. Brown and Sons, Ltd. 1912. *The Author.

The Evolution of Kingston-upon-Hull, as shown by its Plans, by Thomas Sheppard, F.G.S., F.S.A. (Scot.). Maps. Plans. Illustrations. Hull: Hull Corporation. 1911. *The Author.

The History of Northumberland, by Cadwallader J. Bates. London: Elliot Stock. 1895. *Mr. and Mrs. E. S. Memorial, Vol. 46.

EUROPE.

Svenska Turistföreningens Arsskrift, 1917. Illustrated. Stockholm: Wahlstrom and Widstrand. 1917. *Svenska Turistföreningens (The Swedish Touring Club).

Letters from Finland, August, 1908—March, 1909, by Rosalind Travers. Map and Illustrations. London: Kegan Paul, Trench Trübner and Co. 1911. *Mr. and Mrs. E. S. Memorial, Vol. 47.

The "Times" Russian Section. No. 28. *Mr. Isaac Chorlton.

Russia. Britain's Greatest Opportunity. Vol. I, Nos. 1, 2, 3. Maps, Diagrams and Illustrations. London: R. Martens and Co. 1917.

More Italian Yesterdays, by Mrs. Hugh Fraser. Illustrated. London: Hutchinson and Co. 1915. *Mr. and Mrs. E. S. Memorial Vol., No. 31.

Seekers in Italy. Being a quest for Persephone, by Jane and Peripatetica. Done in the Vernacular by Elizabeth Bisland and Anne Hoyt. Illustrated. London: John Lane. 1909. *Mr. and Mrs. E. S. Memorial Vol., No. 32.

Forty Years in Constantinople, 1873-1915. By Sir Edwin Pears. Illustrated. London: Herbert Jenkins. 1916. *Mr. and Mrs. E. S. Memorial Vol., No. 33.

ASIA.

Through Siberia: the Land of the Future, by Fridtjof Nansen, G.C.V.O., D.Sc., Ph.D., etc. Translated by Arthur G. Chater. Maps and Illustrations. London: William Heinemann. 1914. *Mr. and Mrs. E. S. Memorial Vol., No. 51.

A Summer on the Yenessi (1914), by Maud D. Haviland. Illustrated. London: Edward Arnold. 1915. *Mr. and Mrs. E. S. Memorial, Vol. 48.

Across the Roof of the World: A Record of Sport and Travel through Kashmir, Gilgit, Hunza, the Pamirs, Chinese Turkistan, Mongolia and Siberia, by Lieut. P. T. Etherton, F.R.G.S., F.Z.S. Map and Illustrations. London: Constable and Co. 1911. *Mr. and Mrs. E. S. Memorial Vol., No. 53.

The Caliphs' Last Heritage. A Short History of the Turkish Empire, by Lieut.-Col. Sir Mark Sykes, Bart., M.P. Maps and Illustrations. London: Macmillan and Co. 1915. *Mr. and Mrs. E. S. Memorial, Vol. 50.

Queer Things about Persia, by Eustache de Lorey and Douglas Sladen. Illustrated. London: Eveleigh Nash. 1907. *Mr. and Mrs. E. S. Memorial Vol., No. 52.

Ruins of Desert Cathay. Personal Narrative of Explorations in Central Asia and Westernmost China, by M. Aurel Stein. In two volumes. Maps and Illustrations. London: Macmillan and Co. 1912. *Mr. and Mrs. E. S. Memorial Vols., Nos. 56 and 57.

Trans-Himalaya. Discoveries and Adventures in Tibet, by Sven Hedin. In two volumes. Maps and Illustrations. London: Macmillan and Co. 1909. *Mr. and Mrs. E. S. Memorial Vols., Nos. 54 and 55.

- Tenth Report on Plague Investigations in India. Issued by the Advisory Committee appointed by the Secretary of State for India, the Royal Society and the Lister Institute. Maps and Diagrams. London: The Journal of Hygiene, Plague Supplement V. 1917. *The Advisory Committee.
- Kulu and Lahoul. By the Hon. C. G. Bruce (Lieut.-Col.). With Illustrations and a Map. London: Edward Arnold. 1914. *Mr. and Mrs. E. S. Memorial Vol., No. 34.
- Punjab District Gazetteers. A Vols. Vols. II, Hissar District and Loharu State. XIX, Lahore. XXX, Ferozepore District. Lahore: 1916. *H.M. Secretary of State for India.
- Central Provinces District Gazetteers. Balaghat, Betul, Chanda, Wardha Districts. B Volumes. *H.M. Secretary of State for India.
- Madras District Gazetteers. Cuddapah. Vol. I. Madras: 1915. *H.M. Secretary of State for India.
- Bengal District Gazetteers. A Vols. Vol. XXXVIII, Rajshahi. Calcutta: 1916. *H.M. Secretary of State for India.
- District Gazetteers of the United Provinces of Agra and Oudh. Supplementary Notes and Statistics to Vols. I, Dehra Dun; IV, Meerut; V, Bulandshahr; XIX, Cawnpore; XXIV, Jhansi; XXVII, Mirzapur; XXXVII, Lucknow; XLIV, Gonda. Allahabad: 1916. *H.M. Secretary of State for India.
- Bihar and Orissa District Gazetteers. Ranchi, A Vol.; Manbhum, Statistics 1900-1901 to 1910-1911. *H.M. Secretary of State for India.
- Burma Gazetteer. A Vol. Pegu District. *H.M. Secretary of State for India.
- The Pacification of Burma. By Sir C. Crosthwaite, K.C.S.I. Maps and Illustrations. London: Edward Arnold. 1912. *Mr. and Mrs. E. S. Memorial Vol., No. 35.
- Unknown Mongolia. A Record of Travel and Exploration in North-West Mongolia and Dzungaria, by Douglas Carruthers. With three chapters on Sport, by J. H. Miller, F.Z.S.; and a Foreword, by the Right Hon. Earl Curzon of Kedleston, K.G., G.C.S.I., etc. In two volumes. Maps. Diagrams and Illustrations. London: Hutchinson and Co. 1913. *Mr. and Mrs. E. S. Memorial Vols., Nos. 58 and 59.

AFRICA.

- A Search for the Masked Twareks, by W. J. Harding King, M.R.A.S., F.R.G.S. Map and Illustrations. London: Smith, Elder and Co. 1903. *Mr. John Walkden's Memorial Vol., No. 3.
- The Gateway to the Sahara. Observations and experiences, by Charles Wellington Furlong, F.R.G.S. Maps and Illustrations. London: Chapman and Hall. 1909. *Mr. John Walkden's Memorial Vol., No. 4.
- The Flooding of the Sahara: An Account of the proposed plan for opening Central Africa to commerce and civilization from the North-West Coast, by Donald Mackenzie. Map and Illustrations. London: Sampson, Low and Co. 1877. *Mr. John Walkden's Memorial Vol., No. 2.
- In French Africa: Scenes and Memories, by Miss Betham Edwards. Illustrations. London: Chapman and Hall. 1912. *Mr. John Walkden's Memorial Vol., No. 1.

- Across the Sahara, from Tripoli to Bornu, by Hanns Vischer, M.A., F.R.G.S. Map and Illustrations. London: Edward Arnold. 1910. *Mr. John Walkden's Memorial Vol., No. 9.
- Through Timbuctu and Across the Great Sahara. An account of an adventurous journey of exploration from Sierra Leone to the Source of the Niger, following its course to the bend at Gao and thence across the Great Sahara to Algiers, by Captain A. H. W. Heywood, F.R.G.S. Map and Illustrations. London: Seeley, Service and Co. 1912. *Mr. John Walkden's Memorial Vol., No. 10.
- Sierra Leone Messenger, 1917, Nos. 97-100. *Rev. F. C. Smith, M.A., F.R.G.S.
- Across Widest Africa. An account of the country and people of Eastern, Central and Western Africa as seen during a Twelve Months' Journey from Djibuti to Cape Verde, by A. Henry Savage Lander. In two volumes. Map and Illustrations. London: Hurst and Blackett. 1907. *Mr. John Walkden's Memorial Vols., Nos. 5 and 6.
- From the Niger to the Nile, by Lieut. Boyd Alexander. In two volumes. Maps and Illustrations. London: Edward Arnold. 1907. *Mr. John Walkden's Memorial Vols., Nos. 7 and 8.
- From Hausaland to Egypt, through the Sudan, by H. Karl W. Kumm, Ph.D. Maps and Illustrations. London: Constable and Co. 1910. *Mr. John Walkden's Memorial Vol., No. 11.
- Nigeria, its Peoples and its Problems, by E. D. Morel. Maps and Illustrations. London: Smith, Elder and Co. 1911. *Mr. John Walkden's Memorial Vol., No. 13.
- A Resident's Wife in Nigeria, by Constance Larymore. Illustrated. London: George Routledge and Sons. 1908. *Mr. John Walkden's Memorial Vol., No. 14.
- With the Tin Gods. by Mrs. Horace Tremlett. Illustrated. London: John Lane. 1915. *Mr. John Walkden's Memorial Vol., No. 16.
- Chiefs and Cities of Central Africa. Across Lake Chad by way of British, French, and German Territories, by Olive Macleod. Maps and Illustrations. London: William Blackwood and Sons. 1912. *Mr. John Walkden's Memorial Vol., No. 15.
- From Ruwenzori to the Congo. A Naturalist's Journey Across Africa, by A. F. R. Wollaston. Maps and Illustrations. London: John Murray. 1908. *Mr. John Walkden's Memorial Vol., No. 12.
- A Journey to Ashango-Land: and further penetration into Equatorial Africa, by Paul B. Du Chaillu. Map and Illustrations. London: John Murray. 1867. *Mr. John Walkden's Memorial Vol., No. 17.
- Savage Man in Central Africa: A Study of Primitive Races in the French Congo, by Adolphe Louis Cureau. Translated by E. Andrews. Map and Illustrations. London: T. Fisher Unwin. 1915. *Mr. John Walkden's Memorial Vol., No. 18.
- Travel and adventures in the Congo Free State, and its Big Game Shooting, by Bula N'Zau (Henry Bailey). Map and Illustrations. London: Chapman and Hall. 1894. *Mr. John Walkden's Memorial Vol., No. 19.
- Camp and Tramp in African Wilds. A Record of Adventures, Impressions and Experiences during many years spent among the Savage Tribes round Lake Tanganyika and in Central Africa, with a description of Native

Life, Character and Customs, by E. Torday. Map and Illustrations. London: Seeley, Service and Co. 1913. *Mr. John Walkden's Memorial Vol., No. 20.

The New Africa. A Journey up the Chobe and down the Okovanga Rivers. A Record of Exploration and Sport, by Aurel Schulz, M.D., and August Hammar, C.E. Map and Illustrations. London: William Heinemann. 1897. *Mr. John Walkden's Memorial Vol., No. 21.

Through the Heart of Africa. Being an account of a Journey on Bicycles and on Foot from Northern Rhodesia past the Great Lakes to Egypt undertaken when proceeding home on leave in 1910, by Frank H. Melland, F.R.G.S., F.Z.S., F.R.A.I., and Edward H. Cholmeley, F.R.A.I. Map and Illustrations. London: Constable and Co. 1912. *Mr. John Walkden's Memorial Vol., No. 22.

Through Jubaland to the Lorian Swamp, by I. N. Dracopoli, F.R.G.S. Maps and Illustrations. London: Seeley, Service and Co. 1914. *Mr. and Mrs. E. S. Memorial Vol., No. 36.

AMERICA.

The Canada Year Book, 1915. Maps and Illustrations. Published by authority of the Right Hon. Sir G. E. Foster, K.C., M.G., M.P., Minister of Trade and Commerce. Ottawa: 1916. *The High Commissioner of Canada.

New Rivers of the North (Canada). The yarn of two amateur Explorers, by Hulbert Footner. Map and Illustrations. London: T. Fisher Unwin. 1913. *Mr. and Mrs. E. S. Memorial Vol., No. 37.

Alaska: An Empire in the Making, by John J. Underwood. Map and Illustrations. London: T. Fisher Unwin. 1913. *Mr. and Mrs. E. S. Memorial Vol., No. 38.

The Cradle of the Deep. An account of a voyage to the West Indies, by Sir Frederick Treves, Bart. Maps and Illustrations. London: Smith, Elder and Co. 1908. *Mr. and Mrs. E. S. Memorial Vol., No. 40.

A Woman in the Wilderness, by Winifred James. 2nd Edition, pp. 291. London: Chapman and Hall, Ltd. 1916. *Mr. and Mrs. E. S. Memorial Vol., No. 39.

A Journey Across South America from the Pacific Ocean to the Atlantic Ocean, by Paul Marcoy. Maps and Illustrations. 2 Vols. bound in four. London: Blackie and Son. 1872. *Mr. James Williams.

Across Unknown South America, by A. Henry Savage Landor. In two volumes. Maps and Illustrations. London: Hodder and Stoughton. 1913. Mr. and Mrs. E. S. Memorial Vols., Nos. 61 and 62.

La Soberania Chilena en las Islas al sur del Canal Beagle. Professor J. Guillermo Guerra. Maps. Santiago de Chile: Imprenta Universitaria. 1917. *The Author.

The Countries of the King's Award, by Col. Sir Thomas Hungerford Holdich, K.C.M.G., K.C.I.E., C.B. Map and Illustrations. London: Hurst and Blackett. 1904. *Mr. and Mrs. E. S. Memorial Vol., No. 63.

OCEANIA.

- My Life in Sarawak, by the Ranee of Sarawak. Preface by Sir Frank Swettenham, G.C.M.G. Map and Illustrations. London: Methuen and Co. 1913. *Mr. and Mrs. E. S. Memorial Vol. 49.
- The Ways of the South Sea Savage. A Record of Travel and Observation amongst the Savages of the Solomon Islands and Primitive Coast and Mountain Peoples of New Guinea, by Robert W. Williamson, M.Sc. Map and Illustrations. London: Seeley, Service and Co. 1914. *Mr. and Mrs. E. S. Memorial Vol., No. 60.

POLAR REGIONS.

- In Northern Mists. Arctic Exploration in Early Times, by Fridtjof Nansen, G.C.V.O., D.Sc. Translated by Arthur G. Chater. In two volumes. Maps and Illustrations. London: William Heinemann. 1911. *Mr. and Mrs. E. S. Memorial Vols., Nos. 64 and 65.
- The People of the Polar North: A Record, by Knud Rasmussen. Compiled from the Danish Originals and Edited by G. Herring. Illustrations by Count Harold Moltke. Map. London: Kegan Paul, Trench, Trübner and Co. 1908. *Mr. and Mrs. E. S. Memorial Vol., No. 66.
- Conquering the Arctic Ice, by Ejnar Mikkelsen. Maps and Illustrations. London: William Heinemann. 1909. *Mr. and Mrs. E. S. Memorial Vol., No. 67.
- The North Pole, by Robert E. Peary. With an Introduction by Theodore Roosevelt. Map and Illustrations. London: Hodder and Stoughton. 1910. *Mr. and Mrs. E. S. Memorial Vol., No. 68; per Mr. J. Stephenson Reid
- The Home of the Blizzard. Being the Story of the Australasian Antarctic Expedition, 1911-1914, by Sir Douglas Mawson, D.Sc., B.E. In two volumes. Maps and Illustrations. London: William Heinemann. 1915. *Mr. and Mrs. E. S. Memorial Vols., Nos. 69 and 70.

List of Corresponding Societies, etc. (Exchanges).

BRITISH.

- Belfast. Natural History and Philosophical Society. Report and Proceedings for the Session 1915-1916.
- Cardiff. Naturalists' Society. Report and Transactions, 1915, Vol. XLVIII; 1916, Vol. XLIX.
- Croydon. Natural History and Scientific Society. Proceedings and Transactions, 1916-1917.
- Edinburgh. The Royal Scottish Geographical Society. The Scottish Geographical Magazine, 1917, Vol. XXXIII, Nos. 1-12 and Index.

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- Glasgow. Geological Society. Transactions. Vol. XVI, Part I.
- Glasgow. Royal Philosophical Society. Proceedings, 1915-1916, Vol. XLVII.
- Hertford. Hertfordshire Natural History Society and Field Club. Transactions. Vol. XVI, Parts 3, 4.
- Hull. Yorkshire Naturalists' Union. Part 35, 1913.
- Leeds. Yorkshire Geological Society. Proceedings. Vol. XVIII; XIX, Parts 2 and 3.
- Liverpool. Geographical Society. Transactions and Twenty-fifth Annual Report for the year 1916.
- London. The Anti-Slavery Reporter and Aborigines' Friend. 1916, Series V, Vol. VI, No. 4; VII, 1, 2, 3.
- London. British Association for the Advancement of Science. Report of the Eighty-sixth Meeting, held in Newcastle-on-Tyne in 1916. Report of the Corresponding Societies' Committee and of the Conference of Delegates held in Newcastle-on-Tyne, 1916.
- London. Colliery Guardian, 1917, Nos. 2923-2974.
- London. The Colonial Journal. Vol. X, 3, 4; XI, 1, 2.
- London. The Royal Colonial Institute Journal. "United Empire." Vol. VIII, Nos. 1-12.
- London. East India Association. Journal, 1917, Vol. VIII, Nos. 1-4.
- London. Royal Geographical Society. The Geographical Journal, 1917, Jan. to Dec. Year Book and Record, 1916.
- *London. Imperial Institute. Bulletin. Vol. XIV, No. 4; XV, 1-3.
- London. India Office. (See List of Books).
- London. Royal Botanic Gardens, Kew. Bulletin, 1917, Nos. 1-10 and Appendices I-II.
- London. Royal Society of Literature. Transactions. Vol. XXXV. Report and List of Fellows, 1917.
- London. The Near East, 1917, Nos. 296-347.
- London. War Office. Geographical Section, General Staff. (See List of Maps.)
- London. War Office Library. Accessions, 1916, January to December. Catalogue of the War Office Library. Supplements Parts I, II and III. (Fifth Annual Supplement, 1916.)
- Manchester. The British Cotton Growing Association. Publications. Nos. 64, 65.
- Manchester. Literary and Philosophical Society. Memoirs and Proceedings. Vol. 60, Part III; 61, I.
- Manchester. Museum. The University. Publications, 80, 81.
- Manchester. The Textile Recorder, 1917, January to December.
- Oxford. Clarendon Press. (See List of Books.)
- Rochdale. Literary and Scientific Society. 38th Annual Report, 1916. Transactions, Vol. XI, XII.
- York. Yorkshire Philosophical Society. Annual Report for 1916.

MISSIONARY.

- London. The British and Foreign Bible Society. "The Bible in the World," 1917, January to December. Manchester and Salford Auxiliary, Annual Report, 1916.

- London. Church Missionary Society for Africa and the East. Report of Proceedings, 118th year, 1916-1917.
- London. Church Missionary Review, 1917, January to December.
- London. Colonial and Continental Church Society. Greater Britain Messenger, 1917, January to December.
- London. Society for Propagation of the Gospel in Foreign Parts. Report of the year 1916.
- London. Universities' Mission to Central Africa. "Central Africa." 1917, January to December.
- London. The United Methodist Church. "Missionary Echo." 1917, Jan. to December.

COLONIAL.

- Adelaide. Royal Geographical Society of Australasia; South Australian Branch. Proceedings for the Session 1915-1916, Vol. XVII.
- Brisbane. Royal Geographical Society of Australasia. Queensland Branch. Queensland Geographical Journal, 1914-1916, Vols. XXX and XXXI.
- Brisbane. Department of Mines. Queensland Geological Survey. Publications, Nos. 250, 221 A and B (Atlas, 36 sheets).
- Bulawayo. Rhodesia Scientific Association. Proceedings, 1913-1914, Vol. XIII.
- Cape Town. Royal Society of South Africa. Transactions. Vol. V, Part 6; VI, 1, 3, 4.
- Georgetown. The Royal Agricultural and Commercial Society of British Guiana. The Journal. "Timehri." Vol. IV, June, 1917.
- Melbourne. Royal Geographical Society of Australasia (Victorian Branch). Victorian Geographical Journal. Vol. XXXIII, 1917.
- Perth. Western Australia Geological Survey (per favour of the Agent-General). Bulletins, Nos. 60, 63, 66.
- Port Moresby. Papua. Annual Report for the year 1915-1916.
- Quebec. Société de Géographie. Bulletin. Vol. X, No. 6, 1916; XI, 1-6, 1917.
- Sydney. New South Wales. Department of Mines. Annual Report for the year 1916. Records. Vol. IX, Part III.
- Sydney. New South Wales. Department of Mines. Geological Survey. Mineral Resources. No. 24.
- Victoria, B.C. Minister of Mines. Province of British Columbia. Annual Report, 1916.
- Wellington, New Zealand. Department of Lands and Survey. Report of the Department, 1915-1916, 1916-1917; Report on the Survey Operations, 1915-1916, 1916-1917; Report on Scenery Preservation, 1915-1916, 1916-1917. Magnetic Survey for 1903. (Maps.)

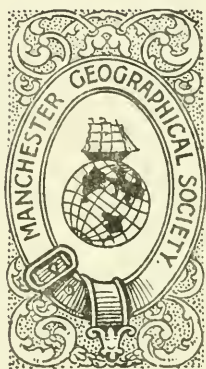
FOREIGN.

- Alger. Société de Géographie d'Alger et de L'Afrique du Nord. Bulletin, 1916, 1917.
- Baltimore. Johns Hopkins University. Studies in Historical and Political Science. Series XXXV, Nos. 1-4. Circulars, 1916, Nos. 1-10.
- Bordeaux. Société de Géographie Commerciale. Revue, 1917, Nos. 1-6.
- Buenos Aires. Monthly Bulletin of Municipal Statistics. 1916, Nos. 11-12; 1917, 1-2, 5-10.
- Buenos Aires. Ministerio de Agricultura de la Nacion. Boletin. Tomo XX, Nos. 9-12; XXI, 1.
- Cambridge. Peabody Museum of American Archaeology and Ethnology. Harvard University. 50th Report, 1915-1916. Papers, Vol. VII.
- Christiania. Norges Geografiske Opmaalning. (See List of Maps.)
- Copenhagen. Geografisk Tidsskrift udgivet of Bestyrelsen for det Kongelige Danske Geografiske Selskab. Bind XXIV, Hefte 1-4.
- Firenze (Florence). Rivista Geografica Italiana e Bollettino della Società di Studi Geografici e Coloniali. Annata XXIV, Fascs. 1-10.
- Geneva. "Le Globe." Organe de la Société de Géographie. Bulletin. Tome LVI.
- Geneva. Société des Anciens Elèves de l'Ecole Supérieure de Commerce. Bulletin. Nos. 113-116.
- Havre. Société de Géographie Commerciale. Bulletin XXXI, 2, 3, 4; to XXXIII, 1 (1914 to 1917 in one part).
- La Paz. Sociedad Geografica de La Paz. Boletin, Ano. XI, Nos. 41, 43.
- La Plata. Direccion General de Estadistica de la Provincia de Buenos Aires. Boletin Mensual. Ano. XVI, Nos. 181-183.
- Lima. Sociedad Geografica. Boletin. Tomo XXXII, Trim. IV.
- Lima. Cuerpo de Ingenieros de Minas del Peru. Boletin. Nos. 83, 85.
- Lisbon. Sociedade de Geographia de Lisboa. Boletim. 1916, Nos. 7-12; 1917, 1-6.
- Madison Wisconsin Academy of Science, Arts and Letters. Transactions. Vol. XVIII, Part II.
- Madrid. Real Sociedad Geografica. Boletin. Tomo LIX, Trims. 1-4. Revista. Tomo XIV, 1-12.
- Madrid. Ayuntamiento de Madrid. Boletin, Nos. 1044-1096.
- Mexico. Sociedad Cientifica "Antonio Alzate." Memorias y Revista. Tomo XXXVI, Nos. 1-2.
- Milan. L'Esplorazione Commerciale. Anno XXXII. Fascs. 1-12.
- Montevideo. Anuario Estadístico de la República Oriental del Uruguay. Libro XXIV, 1913 and 1914.
- Montpellier. Société Languedocienne de Géographie. Bulletin. Tome XXXIX, 2-4; XL, 1, 2.

- Naples. Società Africana d'Italia. "L'Africa Italiana." 1916, Fascs. 10-12; 1917, 1-5.
- Neuchatel. Société Neuchateloise de Géographie. Bulletin. Tome XXVI.
- New York. American Geographical Society. The Geographical Review. 1917. January to December.
- New York. American Museum of Natural History. Bulletin. Vol. XXXV, 1916.
- New York. Public Library. Bulletin. 1917. January—December.
- Novara. Istituto Geografico de Agostini. (See List of Maps.)
- Oran. Société de Géographie et d'Archéologie. Bulletin. Tome XXXVII. Nos. 147, 148.
- Paris. Société de Géographie. La Géographie. Tome XXXI, Nos. 1-4.
- Paris. Société de Géographie Commerciale. Bulletin. 1916, October—December; 1917, January—October.
- Paris. Société de Topographie de France. Bulletin. Année 40. Numéro Special, 1916.
- Paris. Comité de L'Afrique Française et du Comité du Maroc. Bulletin. 1917, Nos. 1-12. Renseignements Coloniaux. 1917, Nos. 1-12.
- Philadelphia. American Philosophical Society. Proceedings. Vol. LV, No. 8; LVI, 1 2.
- Philadelphia. The Commercial Museum. "Commercial America." 1917, January to December.
- Philadelphia. Geographical Society of Philadelphia. Bulletin. 1917, Nos. 1-4.
- Philadelphia. University of Philadelphia. The Museum Journal. Vol. VIII, No. 3.
- Rochefort. Société de Géographie. Bulletin. Tome XXXVI, Nos. 3, 4.
- Roma. Reale Società Geografica. Bollettino. 1917, Nos. 1-12.
- Roma. Direzione Generale della Statistica e del Lavoro. Annuario Statistico Italiano. 1915, Vol. V.
- Rome. International Institute of Agriculture. Monthly Bulletin of Agricultural Intelligence and Plant Diseases. 1916, Nos. 10-12; 1917, 1-11.
- Shanghai. Chinese Maritime Customs. Gazette. Statistical Series. Nos. 3 and 4. Returns of Trade and Trade Reports. 1916, Part 1; Part II, Vols. 1-5; III, Vols. 1, 2.
- Shanghai. Ministry of Communications. Directorate General of Posts. II. Public Series: No. 2. Report on the Working of the Chinese Post Office for 1916.
- Stockholm. Svenska Sällskapet för Antropologi och Geografi. "Ymer," 1916. Häft 4; 1917, 1, 2.
- Toulouse. Société de Géographie. Bulletin. 1916, Nos. 1-3; 1917, 1.
- Urbana. Illinois State Geological Survey. Bulletins, Nos. 20, 27, 33, 35. Illinois Coal Mining Investigations, Co-operative Agreement. Bulletin. Nos. 15, 17, 18.

- Washington, D.C. National Geographic Society. National Geographic Magazine. 1917, Vol. XXXI, Nos. 1-6; XXXII, 1-6.
- Washington, D.C. Department of Commerce, United States Coast and Geodetic Survey. "Hypsometry," No. 41.
- Washington, D.C. United States Department of the Interior. General Information regarding Crater Lake, Glacier, Mesa Verde, Mount Rainier, Sequoia and General Grant, Yellowstone, Rocky Mountain and Wind Cave National Parks; Season of 1917. Sieur de Monts National Monument, Rocks, Woods, etc.
- Washington, D.C. U.S. Geological Survey. Mineral Resources for the year 1915. Part 1, Nos. 3, 4, 5, 7; Part 2, Nos. 12-20.
- Washington, D.C. U.S. Geological Survey. Bulletin, Nos. 627, 630, 635, 636, 638, 640 (A—E), 641 (A—E).
- Washington, D.C. U.S. Geological Survey. Professional Papers. Nos. 91, 98 (I—N).
- Washington, D.C. U.S. Geological Survey. Water Supply Papers. Nos. 360, 384, 387, 395, 397, 398, 399, 400 (A).
- Washington, D.C. U.S. Geographic Board. Decisions, Jan. 3rd, 1917.
- Washington, D.C. U.S. Bureau of Education. Report of the Commissioner for the year ending June 30, 1916. Vols. 1 and 2.
- Washington, D.C. Library of Congress. Annual Report, 1916.
- Washington, D.C. Pan American Union. Bulletin. 1917, January to Dec.
- Washington, D.C. Carnegie Institution. Department of Terrestrial Magnetism. Annual Report for 1916.

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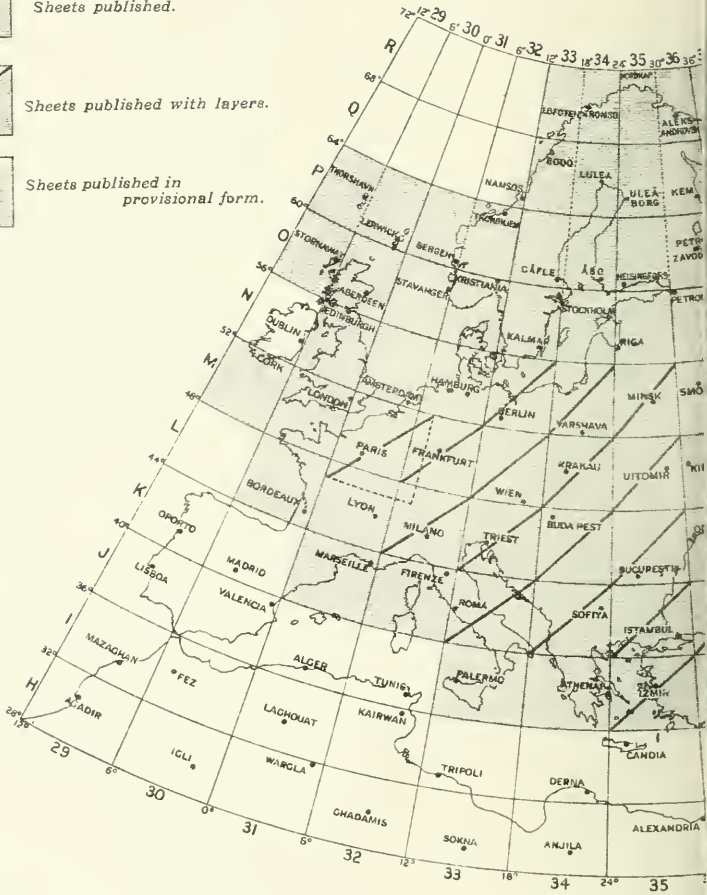
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Sheets published with layers.



Sheets published in provisional form.



$\frac{1}{100000}$ MAP.



Ordnance Survey, 1919.

The Journal

OF THE

Manchester Geographical Society.

* * *

BRITISH CARTOGRAPHY DURING THE WAR.

By Colonel HENRY T. CROOK, V.D., M.Inst.C.E.

(Addressed to the Society in the Geographical Hall on
Tuesday, October 1st, 1918.)

EARLY in the autumn of each year the Councils of Scientific and other Societies and Institutions have to consider the programme of work for their forthcoming sessions. In that of 1914 they were faced with a difficult problem, for the summer had witnessed the bursting of the long threatening war cloud. Western civilization was reeling under the lightning blows of the Hun. Nearly all of Belgium and some of the fairest provinces of France lay blasted by the storm. The immortal Seven Divisions of our old army were heroically facing it in the region of its greatest violence. Our Territorials were departing overseas. The better part of the remainder of the young manhood of the nation was crowding to the colours eager to train to take its place in the field. Thousands of homes were mourning the loss of kith and kin fallen in the fight. The time and energies of others, who could not undertake military duty, were absorbed in work of various kinds in connection with the war. Under such conditions the question for the councils was how far they should or could go in continuation of their usual activities.

In 1915 the situation was perhaps even more complicated in consequence of the increased strain of the war and of war work. But it was then seen that the war had stimulated invention and given rise to many new problems in almost every branch of science, in political and social economy, organisation and government. In truth it would be difficult to name the avenue of human interest unaffected.

Whilst it is the duty of all to make every possible sacrifice

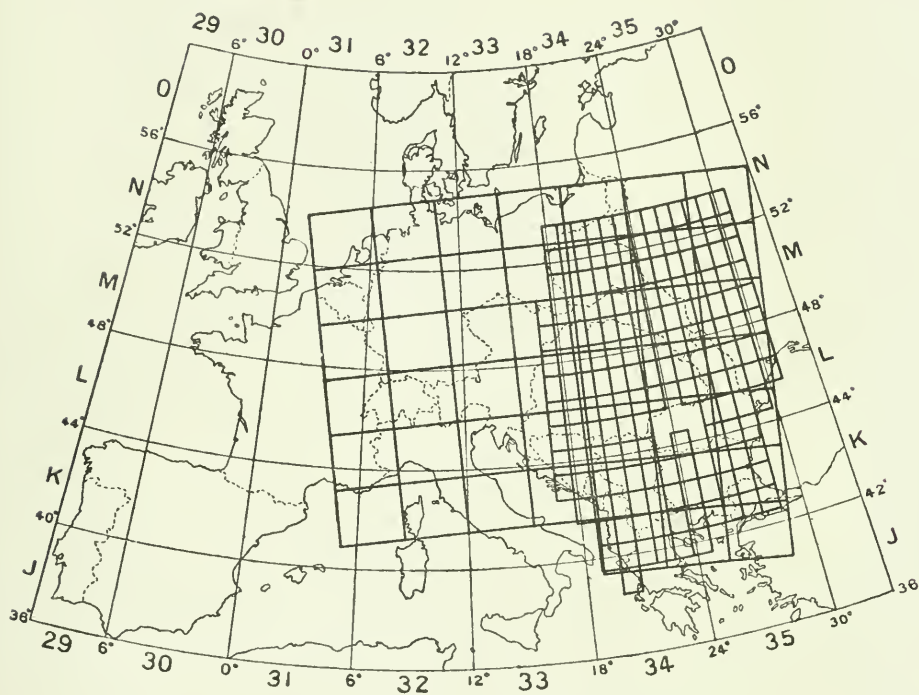
Vol. XXXIV. Parts I.—IV., 1918.

of personal interests or pleasures to the end of helping our soldiers to win the war it is at the same time the duty of those of us who are precluded from active military service to give thought and attention to the problem rising out of the great upheaval; to the problems of reconstruction for the spiritual and material welfare of our country and empire in the days to come, when the noise of battle shall have died away and the manhood of the nations be free to resume their peace time callings.

The war has shown us that there are departments of knowledge in which the education of our people has been inadequate or neglected, or the instruction has not been imparted on right lines. There is therefore ample scope for the work of scientific and other learned societies, for most of the inventions, discoveries or advances in science, the outcome of the necessities of war, will in their subsequent developments be of use and benefit to humanity in time of peace. There is scarce any branch of science or research that will not receive a fresh impetus, and, let us hope, greater assistance, both from Government and public support, than has been received in the past. Perhaps in no field is there wider scope than in that of geography.

The Royal Geographical Society set an admirable example. Few, if any, societies can show a better record of useful service to the nation, in assistance directly afforded to Government Departments during the war, in the education and enlightenment of the public by the series of papers and discussions upon what the President has justly called "world politics" forced on our attention by the war, and in papers descriptive of the many zones of combat, or elucidating the great racial ethnographical, economic and frontier questions for which solution must be found at its conclusion, if that conclusion is to be a conclusion and not merely a temporary cessation of hostilities. In no part of that record of service has its assistance been of greater value than in that of cartography.

I do not purpose speaking to-night of the larger scale maps produced mainly for civil and administrative purposes, nor of the great work accomplished by the overseas branch of the Ordnance Survey in the production of the special maps required during the long warfare of positions, but of topographical and kindred maps such as those which have



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Limits of Austrian. 1 750,000 and 1 200,000.

lately been presented to the Society by the War Office, and which form the major portion of the exhibition now on view in this Hall. The word topographical has been and is still sometimes improperly used to describe maps which are not worthy of inclusion in that class. In some cases it has been applied to maps in which any indication of the third dimension was absent. The true topographical map had its origin in military necessities, and it is to the present military necessities that we owe the advances in the science and art of its production which are now being made. Military requirements are : the clear display of the relief of the land and all the natural features, then the work of man upon the surface, the ways of communication, the towns and villages, all these in the greatest detail which the scale upon which the map is produced will allow of without confusion or the obscuration by, or sacrifice of one class of detail for another.

For the proper delineation of this mass of information a certain amplitude of scale is essential. It is obvious that it cannot be a fixed one, for so much depends on the character of the terrain, the density and occupations of the population, and the state of development of the communications. A scale which is sufficient for a thinly populated region of plains does not afford space for the clear representation of broken or complicated mountainous country thickly populated, such, for example, as Switzerland. Modern industrial developments with the concurrent improvements in means of communication make the choice of a suitable scale more difficult, for that which would be ample for the greater portion of the area of a particular country will not suffice for its crowded industrial regions. For most of the earlier military topographical maps of European States scales ranging between 1/75,000 and 1/100,000 were adopted, the British in the original one inch map adopting the exceptionally large one of 1/63,360.

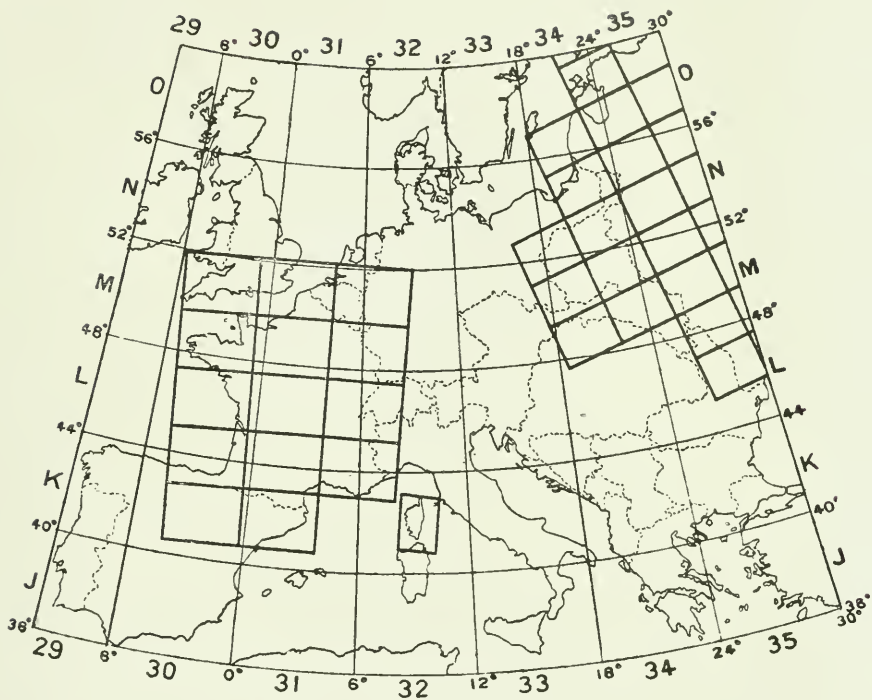
To depict any given area of ground on the 1/63,360 scale requires nearly $2\frac{1}{2}$ times the map area of the 1/100,000 or an increase in the cartographical baggage of an army of 150% if the operations map employed were on the larger of the two scales ; a serious matter in a war of movement. Except for the industrial regions, which form but a limited portion of the area of most countries, a well-designed map on the 1/100,000 scale will fulfil most requirements. But even on this scale the area of country shown on a sheet of convenient size is limited,

hence the necessity for maps on a lesser scale retaining as far as possible all the more important topographical information. Here we arrive at a point where there must be a selection of the detail to be shown, and the more the scale be reduced the greater the care and skill required in that selection and in the draughtsmanship of the map. Sometimes it has been held that such maps are not properly to be called topographical and it has been suggested that below the $1/100,000$ they should be designated chorographical. However, leaving aside these refinements of distinction, let us call them topographical summaries. The important thing is that it is in the production of this class of map that the greatest progress has been made during the war, and that it is the kind which is most generally useful, especially for educational purposes. Any reduction in scale which can be made without too great sacrifice brings the map more in reach of all classes of the community by lessening the cost which in the case of maps of any considerable area on the larger scales is prohibitive. It is of first importance in the preparation of the smaller scale general maps from the larger scale topographical maps that the general map be specially designed for the scale on which it is to be produced and not by the vicious system of mechanical reduction hitherto unfortunately so much favoured by the Ordnance Survey. Given skill of draughtsmanship the quality and accuracy of the minor scale maps will depend upon the quality of the larger scale ones of which they are the summaries.

Amongst the maps we have before us to-night are the following :—

1. General Map of the Gallipoli Peninsula.
 $1/20,000$: Map of the Anzac Position, Gallipoli.
2. $1/100,000$: Flanders and North-East France.
(Reproduced from the Belgian and French Maps.)
3. $1/250,000$: Balkan Regions.
4. $1/250,000$: Palestine and Syria.
5. $1/500,000$: Skeleton Map of Western Europe.
6. $1/750,000$: Skeleton Map of Central Europe.
7. $1/1,000,000$: Carte du Monde or the International Map.
8. $1/1,000,000$: German East Africa.
9. $1/2,000,000$: General Map of German East Africa.

Time will not permit of critical examination of all these. It will be well therefore to concentrate attention upon those of the



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Limits of French. 1/500,000.
and Russian. 1/420,000.

series which best show the progress of British cartographical art.

The maps of the Gallipoli peninsula being compiled from pre-war material, some of which was of doubtful accuracy, are not to be implicitly trusted in the matter of ground forms or detail. A revised edition is much to be desired for those who may wish again to study the military operations, that series of desperate forlorn hopes which make this region for ever sacred to the British race.

No. 2, Flanders and North-east France, is not a new map, but a reproduction from the Belgian and French 1/100,000th; it serves, however, to illustrate some points in cartography of much interest upon which there has been, and in some quarters still is, controversy, especially that of contouring *v.* hill shading. The map is printed in colours. The ground forms shown by contours (in bistre) at vertical intervals of 10 metres, every 100 metre contour being accentuated. For a map on the scale of 1/100,000 this is fairly close contouring even for regions of plains; for more complicated ground, such as the Ardennes, it is very close. The objection often urged against this method of showing the relief of ground is that the contours are not mathematically accurate. The time and labour and consequent cost involved in running accurate contours at close intervals in hilly regions is so great that in the case of a map of large extent it is practically prohibitive, but hill shading, if it is to yield anything like a true picture of the ground, must be based on levelling. The important point then is which of the two methods for the same amount of levelling gives the more information. I think that there can be no question that in the district cited the most artistic hill shading could not approach in clearness and precision the rendering of the terrain given on the Marche and Arlon sheets of this map.

Passing on to the one millionth map, the great achievement of war-time cartography. It is now something like a quarter of a century since the idea of making a map of the world uniform in style and scale was first projected, after which it became a staple topic at geographical congresses. It took definite shape at the official Conference in London in 1909, though some of the principles upon which it was to be constructed were modified at a more fully representative Conference in Paris in 1913. No great progress had been made at

the outbreak of the war in 1914. There were then but seven sheets published, three of which were British productions.

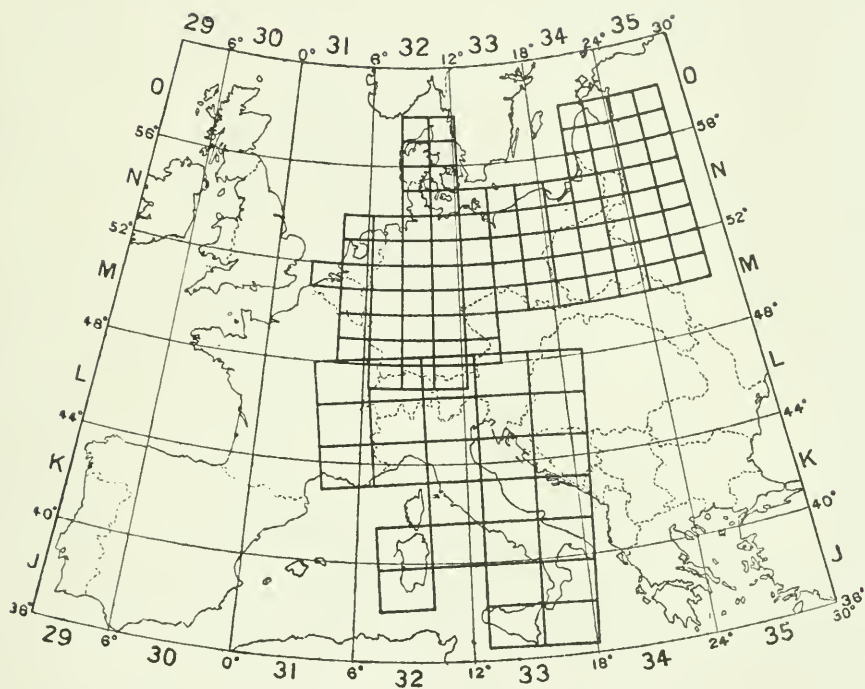
Looking upon the work now before us, the first feeling is one of surprise that it was not undertaken long ago, at least so far as the European part is concerned. All who have occasion to use maps for geographical or historical enquiry or study are familiar, when consulting atlases, with the difficulties and annoyances arising from the sectional illustration and varying scales. To some extent difficulties of a like kind arise in the use of national maps. These difficulties are well shown in the diagrams published with Dr. Hinks' paper in the *Geographical Journal* of July 1915, diagrams which give the sheet lines, areas covered and scales of the maps in Andree's Atlas and of various national maps.* It is hardly possible to get clear ideas upon the relative values of the differing characteristics of regions unless the facts or detail depicted is based on general and universally applied principles and rules.

But it is needless to dwell upon the advantages and utility of a uniform map, they have long been recognised, the trouble was to get the thing done. The war made its provision essential and brought about the co-operation of the Royal Geographical Society and the Geographical Section of the General Staff, which has resulted in the production, in marvellously short time, of this great work. The many and great difficulties which had to be overcome and the manner in which they were surmounted are fully and clearly explained and illustrated in the admirable paper by Dr. Hinks, already referred to.

On the large screen and the screen to your right are displayed in juxta position nearly all the sheets of this map which have been issued to date; over 70 in number.† The larger display, embracing the greater part of Europe with three sheets of Western Asia, is nine sheets in depth and between the parallels of 60° and 52° eight in width. By leaving a quarter inch width of the margin of reference on the top and left sides of the sheets each can be readily identified then by a little humouring in the arrangement of the sheets, which these margins admit of, the gaps at the outer limits of

* Three of the diagrams are, by the courtesy of the Royal Geographical Society, here reproduced.

† See Index Map, page 1. The number of sheets issued is now 96.



By kind permission of the Royal Geographical Society.]

Limits of German. 1/300,000.
and Italian. 1/500,000.

the block of maps due to the projection of the spherical surface are scarcely perceptible.

Having thus a large extent of the map before us we are better able to appreciate the principles of the design and the manner of its execution than we should by the separate examination of the component sheets. We see, for example, the reasons for the rules limiting the number of place names and governing the selection of roads, also the effect of the representation of the relief of the ground by contours at 200 metres vertical intervals, in most cases to the summits of the mountains. The decision to adopt this interval (with an extra contour at 100 metres) was, I think, a most happy one, although it involved a departure from the principle laid down by the Conference at Paris.

The layer colouring on the exhibited map is my handiwork; it is not the official scale of tints, which scale is, I think, hardly sufficiently distinctive. I have preferred a contrast of colour and have only treated four of the layers—viz., 100 to 200 green, 200 to 400 yellow, 400 to 600 bistre, and 1,000 to 1,200 red. The general effect is satisfactory when regarded as a first essay. It does not seem necessary to further extend the colour layers, the veritably mountainous regions being sufficiently portrayed by the contours, the successful result of the adoption of the 200 metres interval. Except in Central Europe the bistre colour on the map shows that there is no great area between the 400 and 600 metres contours. Above that of 600 metres (roughly corresponding to 2,000 feet) the slopes generally become so steep that the width of the layer would be insignificant. The object sought in the application of the crimson tint to the 1,000—1,200 interval was to bring out the long valleys of the Alps and the clarification of the highly-complicated region embraced in the Sofiya sheet.

In the Sofiya sheet the contour lines appear to have been less generalised than in the adjoining sheets which makes the reading difficult unless the band between the 1,000 and 1,200 contours be coloured, though it should be stated that the coloured impression on the screen is not so clear a print of the sheet as that uncoloured one presented by the War Office; the latter is probably a newer edition.

The sheets of the displayed map are of differing dates, being impressions from the first issue as the sheets became available to the public. I think those of later date are dis-

tinctly better in definition than the earlier, though the river system, the foundation of topography, is still sometimes lacking in distinctness. I am not aware whether the particular tint of blue adopted be that of the International Conference, but it appears to be the same as that employed by the Ordnance Survey in the quarter inch to the mile map of England and Wales, and which is one of the defects in that map, for it is not deep enough in tone to bring out clearly the upper waters. In the 1/1,000,000 map it is not until the colour layers are applied that one can realise properly the upper river systems in regions of moderate elevation, and even then in districts crowded with other detail the streams are almost lost. It must of course be recognised that the proportionate development of different classes of detail in a crowded district is the great difficulty in the making of a uniform map, therefore these remarks are to be taken in the spirit in which they are made, that of suggestion and not of fault-finding; for, having regard to the extraordinary conditions under which it was compiled and the high pressure under which it was produced, the map, regarded as a whole, is a veritable triumph of British Cartography. Its usefulness in geographical education cannot be denied. How many erroneous notions to which the youthful, and sometimes older, mind is apt would be avoided were it possible to display on the walls of schoolrooms a picture of Europe and part of Asia such as we have before us to-night.

Compare, for example, the three sheets in the longitudinal strip No. 30 showing the British Isles with the three in strip No. 36, showing the country from just north of Petrograd to the Murman Coast, and one can appreciate the value of the work from an educational point of view and at the same time realise the enormous difficulties of the task so successfully overcome in the making of a uniform map of regions so dissimilar.

There can be no doubt that one of the results of the war will be a greatly increased demand for maps of all kinds and of good quality. Now we shall have a much more critical public, a public which has acquired the map habit, the meaning and use of maps. Its demands will doubtless influence both our National Institution and private publishers to rise to the occasion and provide in adequate manner those essentials of geographical education and general knowledge.

GLIMPSES OF RUSSIAN TURKESTAN,

By WILLIAM STERN, J.P

(Addressed to the Society in the Geographical Hall on
Tuesday, January 15th, 1918.)

THE term Turkestan in its narrow sense covers that portion of the Central Asiatic dominion of Russia which comprises the districts of Transcaspia, Samarkand, Syr-Darya and Semisretchensk. These are situated in the order named, one next to the other, east of the Caspian bordering on Persia, Afghanistan and China. Only a very narrow strip of Afghan territory separates India from direct contact with this part of Russia. The two vassal states, the Khanates of Khiva and Bukhara lie between the Russian provinces named. The total area of Russian Turkestan is about 800,000 square miles, equal to that of Austria, France, Germany and Italy put together.

From the S.W. to the N.E. in a straight line it measures about 2,000 miles, and from N. to S. close upon 1,000 miles.

Three-fourths of this vast area are plain table land, mostly bare steppe or desert, rising from some 80 ft. below the ocean level at the Caspian to about 1,000 ft. above it. There is nothing more dreary or monotonous than passing over these deserts in train, carriage or on camel's back.

Most aptly is one of these endless steppes called the "Famine desert." In early spring and autumn these steppes and deserts are covered with rich grass and all the rest of the year they are absolutely bare and barren, parched and burnt to a deadly khaki colour with not a blade of vegetation, though in places where artificial irrigation has been resorted to, the soil proves suitable for cultivation. Yet the sandy deserts Kara-Kum, east of the Caspian, the Ust-Urt plateau, and Kizyl Kum between the Amu and Syr Daryas, the ancient Oxus and Yaxartes, are still less hospitable. They are simply an ocean of sand, and in a strong wind not only dust and drift are whirling like ghosts across the desert, but veritable waves of sand are seen moving up and down. In calm weather they look like the sea might look could it be

Northern Europe carried on a lively trade by barter with the congealed by frost in its choppy state. From November to April snow and rain abound and then even these sands are covered with grass, but under the burning rays of the sun all vegetation ceases, only here and there dried-up coarse tufts of saksaul remain. These are used for firewood.

The *mineral wealth* is of great variety—salt, naphtha, sulphur, coal, copper, zinc, mercury, silver and gold, turquoise and others are waiting for the advent of capital. Numerous natural mineral waters, hot and cold, may some day compete with Carlsbad, Aix les Bains and Harrogate. Natives take their brine and mud baths in a rather primitive way. They simply dig holes in which the health-seeking patient lies down and is covered to his neck for an hour or so with mud or brine.

The *climate* is keenly continental, very hot summer alternates with comparatively severe winter. The fall of dew is infinitesimal. The great dryness of the atmosphere is made keener by the prevailing E. and N.E. winds which carry away the little humidity exuded by soil and vegetation. July is the hottest month and so late as September the thermometer registers from 90° to 100°F. in the shade. Even so far south as Merv a few degrees of frost are reached in January, the coldest month of the year. Almond, cherry and apricot trees are in full bloom in March. The spring is short and is the pleasantest season. On the whole the climate is a healthy one, and only in low-lying places and near water does malaria exist.

We are still without definite knowledge of the *aboriginal inhabitants* of Turkestan, the Turan of antiquity. The theory we learnt at school that this region was the cradle of humanity, or at any rate of the Aryan race, has been exploded, as has also Max-Müller's teaching of an Aryan race or people. He built his dictum on the shifty foundations of philological research, a basis as shifty as the sands in these deserts, for ethnologically there is no Aryan race. We know that the great Parthian Empire conquered parts of this region in the last century and a half B.C., and just over two centuries of our era that Empire occupied the position of the second nation. We also know that Alexander of Macedonia, imbued with the desire of joining up the East and West into one huge Empire, came as far East as the town of Kokand.

The expulsion of Mongolian hordes about 200 B.C. caused them to overrun the region of the Ili river and Ferghana. They were of course a Turanian people. History has recorded many instances of invasion by hosts from the north and the east as well as from southern and westerly regions. On the whole it may be said that the Turanian character of the people appears probable. From remote antiquity numerous hordes have roamed over the steppes of Upper Asia, from time to time bursting to the south, harassing and subjugating the comparatively unwarlike inhabitants of the warmer countries. After the conquests by Alexander the Great in the fourth century B.C., by the Parthians from S.W., the Scythians from the N., the Mongols from the N.E., and the Chinese from the East—came the Arabs in the eighth century, in the heyday of fervour of their faith, and with firearms in hand spread the teaching of Mahomet.

The rule of the Arabs was not stable, but in the religious feud Islamism defeated the teaching of Zoroaster and became not only the ruling religion, but also the foundation for the further development of Central Asia. With their religion the Arabs introduced an acquaintance with science, and founded a culture which developed successfully until the subsequent fresh descent upon the region by wild and nomadic people. In the twelfth century idolatrous Kara-Chinese emperors subjugated the eastern part of the country. The whole of Central Asia was conquered and ravished by nomadic Mongolians under Tchinghiz-Khan. But in course of time these Mongols, notwithstanding the destruction they brought with them, fell under the spell of the culture of the natives, and Samarcand became in the fourteenth century the capital of the vast realm of Timur Kurgan (the wise). The next three centuries again saw destruction and conquest follow destruction and conquest. The Kirghiz-Karsaks, Kara-Kirghiz, and Kalmycks were victors and vanquished alternately, and in the last century the Khanate of Kokand flourished temporarily. Finally, the Russians, who commenced their designs upon Turkestan under Peter the Great, conquered and hold that region, which has a great future before it.

The intercourse of Russia with the lands of Turkestan is traced back to an epoch which preceded even the foundation of Russia as a state. Already in the seventh century

Central Asiatic people through Russian territory, and in the twelfth and thirteenth centuries caravans from Khiva and Bukhara began to visit Russia which, with the advent of the Tartaro-Mongolian yoke, had to enter into closer acquaintance with Asiatic countries. With the overthrow of the Tartar rule commences the historic movement of Russia towards this Asiatic East and to the lands lying on the other side of the Caspian. The first attempt made by Peter the Great, just 200 years ago, to conquer Khiva, failed lamentably, the expeditionary force being captured and destroyed. One hundred and twenty years later a systematic penetration eastward was commenced by Russia. In 1839 vast numbers of Kirghese became Russian subjects, in 1850 Russian war vessels were masters of the Aral Sea; three years later, after a short siege, the town of Ak-Mechet had to change its name to Perovsk; in 1865 Tashkent fell under Russian dominion after a severe battle, and in 1868 the city of Samarkand, a holy place in the eyes of the Central Asiatic world, the capital of the great Timur, was taken by the Russians; 1875 saw the conquest of the remainder of the Khanate of Kokand with the occupation of Kokand, Marghellan and Andijan. General Skobelev, who had made his name in the Russo-Turkish war in 1877 and 1878, completed the conquest of the southern parts of Transcaspia in 1880. Since 1885, when General Komaroff added the whole of the Merv Oasis after the battle on the river Kushk with the Afghans, the only further territorial aggrandisement of Russia which has taken place in these regions was in 1891 when after a further scrap with Afghanistan the Russians became masters of the whole of the Pamir. The last revision of frontiers in the region took place in 1893 when Russia obtained the town of Fizusi from Persia in exchange for Hissar.

From the earliest ages the roads for commercial intercourse between China and India and the eastern and western Roman Empires—Byzantium and Rome—led over the plains of Turkestan. From the north of Russia costly furs were carried down the Volga and through Turkestan to India and China. Later in the middle ages, when the Italian republics of Genoa and Venice conducted the trade with the East, they reached China by way of Astrakhan, Urgentch, in Khiva, and Kuldja.

The opening of the sea route to India round Africa in 1498 and the decay of all political life in Central Asia after its

Augustan period under Tamerlane (Timur), caused the cessation of commercial relations through Turkestan. It would not appear to be beyond the range of possibility, while one can now travel by rail from Calais to Andijan and Merv, that within a generation the railway terminus may be moved further east via Kuldja to the Yantze-Kiang in China and south to India by way of Herat and Kabul. Thus, as 2,000 years ago, Turkestan may again become the highway and junction of the shorter routes connecting the most thickly populated countries of the two continents.

With the advent of the railways in Turkestan the economic conditions have improved enormously. Turkestan grows and supplies half the quantity of cotton required by Russia—10,000,000 spindles. Currants and other dried fruit, clover, wool, hides, silk, wine, lycopodium, rice and other produce are exported to Russia and Europe.

Into this region, where formerly money was hardly known and where each household lived on its own produce, where a labourer earned about £6 per annum, gold literally began to pour as soon as the railways fostered the extension of the cotton fields. The construction of the Transcaspian Railway was of immense importance to the Russian trade. Incidentally it brought the Province of Khorassan in Persia quite near to Russia. The town of Meshed is only over 100 miles from Askhabad and Dushak stations, whilst 1,000 miles of caravan route separate it from Bender Abass, its former source of supply.

The *hydrography* of Turkestan is peculiar owing to the fact that its few large rivers carry their waters into enclosed seas and lakes such as the Caspian, Aral, Balkhash, Issyk-Kul, Kara-Kul and others. Some rivers lose themselves in the sands owing to great evaporation and to irrigation channels by means of which the water is diverted for agricultural and other purposes. The Atrek is the only river which flows into the Caspian on its eastern shore. There is a theory that in prehistoric time the Oxus also ran into it, but the last word on this topic has not yet been spoken. From the Kapet Dag range of mountains a number of streams run down the northern slopes and reaching the railway sufficiently irrigate the land to produce excellent oases. Further south-east in the Transcaspian mountain rivers abound, and the largest are the Tedjen and Murghab which disappear in the sands of the

Kara Kum desert. The two largest rivers, the Amu Darya and Syr Darya, run through the centre of Turkestan north-westward into the Aral Sea, and with their tributaries irrigate the richest and most thickly populated oases.

A third river of importance here is the Zeravshan, which formerly was a tributary of the Amu Darya but now fails to reach the mother-river by some twenty miles. East of the Syr-Darya the river Tchu flows from the lake of Issyk-Kul to that of Saumal-Kul, a distance of about 600 miles. The Balkhash Lake, about 900 ft. above sea level, is the basin into which a number of considerable rivers contribute their waters, the largest of them being the Ili which has its origin in the Tyan-Shan, about 1,000 miles distant.

All the water basins and rivers of Turkestan are remarkable for the great variation of their levels, according to the year's seasons. Being mainly fed by glaciers and perpetual snows in the mountain ranges, they carry their maximum quantity of water in the summer, the hottest time of the year, when the snows and ice melt, and the minimum in winter and autumn. The main importance of all the rivers lies in the quantity of water they are able to hold and to carry for uses of irrigation. In this direction undoubtedly they will play a still greater part in the future when America or England will take an interest in the irrigation of the sandy and loamy plains of Central Asia.

The population of the whole region is about 10 millions, of which about 6 per cent. are Russian settlers, soldiers, ruling bureaucrats and merchants. Over 90 per cent. of the population is Mahomedan. The Koran, which from its advent had a tendency to regulate all the events of the religious, social, political and private life of the faithful controls even now, not only their actions, but even their thoughts and imagination.

The social life of the Sart is mainly centred in the bazaar. Bazaar rumour, is the source of news and has the characteristic name of *uzun-kulak*, i.e., the "long ear." The centre of every Turkestan town or large village is the bazaar, which is situated either on open spaces or in the form of a labyrinth of narrow streets or lanes. Along both sides of the streets of bazaars are long rows of buildings with a gallery in front. These buildings are divided into small cubicles by means of walls. The front of each cubicle is quite open. The shop

is filled with goods. The customer usually sits down on the threshold of the shop whilst the shopkeeper exhibits his wares to him on a felt-covered floor. These streets are sometimes roofed over by means of bamboo sticks, or wood planks, over which thick matting is thrown and held down by a layer of earth. These roofs shield the vendor and purchaser from the sun, but whilst keeping out the light they help to keep in the vitiated atmosphere. I remember one such row in Samarcand. There was a shop selling melons, next to it a "manufacturer" was weaving on a handloom some silk material, next was a dye-works in which two boys were sitting over two small wooden vats with a stick in each hand—one was dyeing a hank of yarn black and the other was engaged in turning his hank a bright red colour. In the next cubicle were sold dried gourdes of all shapes, used as tobacco pouches, tea canisters, snuff boxes, and the like, whilst adjoining was a confectioner whose exhibits were invisible on account of the thick layer of his constant customers in the shape of black flies and wasps. A brass worker, a grocer and a tea restaurant came next in this most interesting long row. As a matter of fact the restaurant, or Tchai-Khané, was in an open space between two long rows of shop buildings. These tea drinking places are quite a feature. I was taken to see a tea-party at this Tchai-Khané. It consisted of about a dozen people. Bedsteads were used for sitting on and some of the natives squatted on the ground. One tea urn and one bowl were served. A boy half filled the bowl with tea of a green colour and passed it to the man who had ordered it—he being the host. With a very ceremonious bow the host hands it to the chief guest or the oldest guest, who takes it by the bottom rim with the fingers of his right hand and causes by a very delicate movement the liquid to slide just up to the rim where he sips it off, he then goes through a further shaking feat before he takes the next sip. Knowing the art of shaking gracefully the tea-bowl is evidently a sign of good breeding and *savoir faire*. The bowl is then passed to the next guest and so on. All this of course takes time, but if there is anything which has no value in that eastern region it is time. A man who keeps his appointment within an hour of the fixed time is considered too punctilious altogether. Whilst tea is drunk in this equilibristic fashion the "chilim" or "calyan," i.e., the social pipe is going round. All this within sight of

the passers by, and it is just this publicity that host and guests go for—they like to be seen enjoying themselves, like to show off their many-coloured clothes, their graceful manners, and above all they wish the people to see that they have the wherewithal to enjoy the good things of this world.

The Sarts bake no bread, but make flat cakes from wheat. Much rice is grown which is used in the preparing of the popular dish called “plov.” The potato was not known at all in Turkestan up to the arrival of the Russian settlers. Tobacco and plants producing dyes are grown. Apricots and melons with two or three cakes form the native’s usual breakfast and dinner. Gourdes are used for tobacco holders, chilims, *i.e.*, pipes, and as bottles for vinegar. Pistache nuts are invariably part of the “dostarkhan” spread before an honoured guest.

A good horse is a Sart’s best embellishment, and people possessing fine horses are much esteemed. They take great care of them and cover them all over both in summer and winter—in summer to keep off flies and in winter to have them warm.

Sport exists mainly near rivers, lakes and swamps where beast and bird find shelter in the bushes and reeds (partridge, pheasant, ducks, geese, swans, snipe, etc.). Wolves, hare, wild boar, foxes, wild cats, are to be found. They still have cock-fighting pits, and love to organise ram fights, and even camel fights (must be rather uninteresting owing to heaviness and awkwardness of slow movement).

Elementary schools for native children called Maktab-Khané exist only for boys; girls, if taught at all, are probably only taught at the homes of the better-to-do natives. The boys are taught mechanical reading of Arabic, copying mechanically from books without understanding what they read or copy. Arithmetic is not part of the curriculum. Result, although there are so many Maktab-Khanés the great majority of the people are illiterate. Circus whip in hand of master reaching furthest corner!!

The old Madrassabs are still in existence. The students and staff live there and thus they give one the impression of a monastery. The subjects taught are Arabic, Mussulman law in Arabic, Persian and Persian literature (and yet of the two students to whom I spoke in Russian neither had heard of Omar Khayyam). In arithmetic they only know the four

rules of addition, subtraction, multiplication and division, and know nothing of the theory of fractions. History is not taught, and I should gather that the selection of Persian and Arabic books used in the study of these literatures must be a very poor one indeed, for the students acquire most false notions of science. Main stress is laid on religious teaching.

Public health and medical assistance is bound to be in a very primitive state because of the peculiar home conditions owing to religious peculiarities and customs. The Mullah or priest, especially if educated in Bukhara, is generally administering all kinds of sympathetic means and medicines, foremost among which are holy pebbles alleged to have been brought from Mecca or Medina.

Summing up the impressions that a traveller in Turkestan receives it may be said Time is regarded as of no value at all, and similarly money has no attraction for the inhabitants. If a man has enough to provide for his immediate wants he will not work, and should he have a surplus at any time he will take a holiday until he has deprived himself of the incubus. He lives for the moment, and just as he has no thought for the future he has no regard for the past, and leaves to decay the splendid architectural monuments of the golden period of the country in which he exists.

THE REMOTE BERMUDAS.

By J. HERBERT COOKE.

(Addressed to the Society in the Geographical Hall on
Tuesday, February 25th, 1918.)

WHEN you go on board the Quebec Steamship Company's steamer "Bermudian"—and steam along the Hudson River in the depth of winter (with zero weather round about, and all the huge, tall buildings of New York covered with snow)—it is pleasant to think that in forty-eight hours you will be in the land of sunshine and flowers, walking along roads which approximate in character to Devonshire lanes, or any roads in the English West Country. Bright though the sunshine may be, there is a nip about the temperature when on the water, which makes you feel glad at the prospect of warmth.

As you slip down the river, amongst the multitude of ferry boats and shipping, the great bridges of the East River soon slip out of sight, and you are shortly passing through quarantine, with Port Hamilton, Bay Ridge, the south-end of Long Island, Staten Island, and on the Jersey Coast, and soon the steamer is out of the lower bay, and her course is turning towards the south, and presently the low-lying land of the Jersey Coast is lost to sight.

Next day the temperature is perceptibly warmer, and as the ship steams diagonally across the great volume of the Gulf Stream the shallow draft steamer begins to toss about, and the 300 or 400 passengers who are probably carried on these winter trips, become much less visible in the saloon. It seems to be always pretty rough crossing this part of the Gulf Stream, and to the majority of the passengers it is a great relief when early one sunny morning St. David's Point and the lighthouse come into sight. After that the vessel works slowly along a tortuous channel round the northern side of the island, with green meadows in view, bathed in the bright sunshine. The white houses against the dark backgrounds of the cedars which cover the island in all directions,

give a very charming aspect to the prospect. Away in front of us are the stackyards, and the large floating dock, on which great warships can be repaired. Moored near to Ireland Island—upon which these dockyards and repairing shops are situated—there are probably two or three cruisers with attendant colliers and tugs and lighters, and various craft.

We shortly come to anchor, and the official and military tugs board the ship, and there is an examination of the passengers in the saloon; after which the steamer moves away up into the Hamilton Inlet, and shortly the city of Hamilton comes into view, with the picturesquely placed cathedral standing on the high ground. The steamer now makes its way through a narrow passage cut in the rocks, which seems to offer no chance of our ship going through, and as a matter of fact it seems possible almost to touch the shore on either side. We negotiate this, and then we slowly work our way into the inner harbour, and are eventually moored up against the quay in a secure anchorage, as it were, in the middle of the island.

All the population of Bermuda seems to be watching us from the quay. The bright sunshine, the blue sky, the deep blue water, the white quay, the white houses and the white roofs, and the gaily-dressed crowd, with the black wharfingers and porters, all combine to make an interesting and variegated picture. Perhaps instead of calling them negroes I should call them coloured people; they are in a considerable majority in the island—I believe the population is roughly about 5,000 white and 8,000 or 9,000 coloured people.

The landing of the passengers begins soon, and the disposal of the baggage, and the not very severe custom house examination proceeds apace. Lines of carriages are waiting to take the passengers off to their various hotels, and the dock-sheds present a very busy scene.

Bermuda can be reached fortnightly from Halifax, Nova Scotia, running down to the West Indies. This line was acquired comparatively recently by the Royal Mail Steamship Company. The Royal Mail Steamship Company also runs from West Indies to the Island when they made their recent extensions up to New York, and calling at Bermuda on the way—an additional and good service; and when the steamer of this service, the "Carribean" or "Arcadian" steams home

to England for its annual overhaul, a very fine trip from New York via Bermuda, to the West Indies, and then on to Southampton was available. This occasion, however, only happened about twice a year. Freight steamers from London occasionally run direct to Bermuda, but they would not be of much interest to the intending passengers from these islands.

Freight steamers on their way to ports in the Southern States sometimes put into Bermuda for coaling or re-fitting, or are forced in there by stress of weather. Otherwise the Bermudas are just about as remote as they were in the time when Andrew Marvel sang about them. No great ocean highway passes near by. It was expected that the opening of the Panama Canal would alter all that, and that fast passenger and mail services from England to the Pacific Coast of North and South America would be likely to make Bermuda a calling place for coaling purposes and for fresh stores. The Panama Canal was only just beginning to be operative when the War broke out, so all these possibilities by development of direct communication with England have been side-tracked. There should be after the War great possibilities of getting to the Bermudas in probably six or seven of the well-found and well-equipped steamers which will be running to the Pacific Coast. The advantages of this to the winter health-seeker who could go on board a comfortable ocean steamer at Liverpool, and who in five or six days could be transported to a British Colony, where he finds himself amongst English speech, English money, English customs, bright blue skies, and beautiful warm sunshine, a day and night temperature not varying more than two or three degrees, will be a great relaxation after the present strenuous times.

All these blessings are at present only to be readily realised by the dwellers in New York and the other American cities adjacent to the Atlantic seaboard. I might explain here that since America has come into the War practically all passenger communication from New York has been stopped, and indeed the steamer "Bermudian," to which I have often referred, and which was the main stand-by of the passenger travel, having been built specially for the service in order to get into the inner harbour at Hamilton, is in the Mediterranean.

In the early morning of the second day, after our rather tempestuous passage, to some extent diagonally across the Gulf Stream, we gladly make our land-fall and see in the distance the lighthouse of St. David's Head, giving us our first glimpse of the remote Bermudas. This group of islands, often popularly said to number as many as the days of the year, but really somewhere about 100, known as the Bermudas, or Somers, was first discovered by Juan Bermudez in 1515, whilst carrying from the West Indies to Spain the Spanish historian, Ferdinand De Onedo. A casual landing by him may have taken place, but bad weather prevented any extended exploration. Although the islands were known to navigators—mainly Spanish and Portuguese—they gave them a wide berth, as they were believed to be enchanted, and certainly the wide circle of reefs surrounding them would be terrifying to those early navigators. When there is a northerly breeze there is a line of foam and breakers all round the north part of the islands some eight miles away from the land. Probably the buccaneers in those days desired the uncanny reputation of the islands to continue, as they could thereby preserve the secrecy of their bases. Certainly wrecks took place on the reefs in those distant days. It is often asserted that the local colouring of the Bermudas is evident in Shakespeare's "Tempest." The scene of this play has been supposed to be laid in these islands, and evidently our national poet, with his wealth of information about the then known world, was acquainted with their discovery, as he puts into Ariel's mouth the words :—

"Safely in harbour is the King's ship;
In the deep nook where once thou called'st me up
At midnight to fetch dew from the still vexed
Bermudas, there she's hid."

No one who has seen the foam and spray of the great rollers breaking over the chain of reefs around the northern side of the island will fail to realise that Shakespeare sums up the description of the Bermudas in these lines. Other lines in the "Tempest" would quite well fit in with Bermuda's rocky, coral coast.

The associations of the Bermudas in English literature are many. Mr. Sydney Lee, in his "Life of Shakespeare," considers that the reference to the climate of the island in

which Prospero is cast away, and to the spirits and devils which infested it, render its identification with the newly-discovered Bermudas unquestionable. Kipling, also an authority on the Bermudas—holds a similar opinion. Mr. Gosling, a native of Bermuda, maintains the same argument. Andrew Marvel, in his songs of “The Emigrants in Bermuda,” begins with the lines:—

“Where the remote Bermudas ride,
In ocean’s bosom on its side”—

a very excellent description of their situation. The Irish poet, Tom Moore, had an appointment in the island, and has sung a good deal about its varied beauties and its climate.

Apart from the wrecked sailors who eventually made their way to the American mainland, the first real settlement in the islands resulted from the shipwreck of the adventurers who left Plymouth, England, for the plantations of Virginia in June, 1609. On the 23rd July a great West Indian hurricane scattered a fleet of seven ships and two pinnâces, and battered about the “Sea-Venture,” the lightship of the squadron, in which was Sir George Somers, who, after struggling with the elements for several days, was fortunately able to run his foundering ship ashore at the north end of the island, which is now known as St. George’s. All the ship’s company of 140 men and women were safely landed, and with tools, sails, stores, etc., which were found from the “Sea-Venture,” the castaways were able to settle down, and after living there for nine months they were able, with the re-built pinnaces, to renew their voyage and reach the colony of Jamestown, Virginia. Things did not prosper altogether in this infant colony, and Somers volunteered to return to the Bermudas for hogs and fish, but again storms and the unkindly elements were encountered, and as a result of the hardships he died after landing, and was buried at St. George’s in 1610. The “Virginia” Company, which had fitted out the wrecked expedition, decided to colonise the Bermudas.

The Virginia Company governed—or perhaps misgoverned the island until the Crown took over the Colonies about the end of the 17th century. It is notable that in the great maritime struggles of the 17th and 18th centuries that whilst islands up and down the world changed owners the Bermudas always remained under the British flag.

This extension of the American colonies had its effect on Bermuda, but the Bermudians remained loyal, and although there were plans put forward for the capture of the island by the French, backed by the newly-constituted Republic, no serious attempts were made upon the island.

Meanwhile, the British Government recognised the strategic importance of the island as a naval and military base. This importance it has retained, and, although perhaps in those piping times of peace which preceded the great cataclysm in which we now live, and the fact that we are now on the best of terms with our great neighbour on the North-American mainland, caused the Government to let the dock-yard equipment of this remote station tend to run down, they were very glad to have a base during the first few months of war, when our command of the ocean was somewhat threatened, or at any rate when the new German cruisers were till at large in the Atlantic Ocean, and the "Karlsruhe" at any rate was carrying on her depredations in the Carribean and on the West Indian routes. Some of our cruisers from the Bermuda base were at her heels several times, but they never managed to get her. It was interesting to see these cruisers with their various disguises of painting and jury funnels and jury masts, coming and going.

In those early days of the War camouflage had not taken its place in the language. Some of these cruisers were always patrolling the American coast, and examining and sometimes searching ships for Europe, and in the earlier months of the War the "Essex," "Bristol" or other cruiser of that class, was to be seen hanging round the three mile limit off Sandy Hook, with an American battleship, say the "Texas," lying inside the American waters, and nodding, as it were, to each other. At that time the United States were not directly affected by the War, and there was some grumbling amongst the American passengers at the presence of British warships off their coast, at the gateway of their metropolis, and it was a proof of the omnipresence of the British Fleet to have the searchlight of an examining cruiser flashed upon you on an Atlantic trip.

One of the interesting warship visitors in that first winter of the War was H.M. Australian warship "Sydney," which arrived one day in Bermuda after her long trip from Gibraltar to coal and proceed on some further patrolling duties, which

were understood to be in pursuit of the elusive "Karlsruhe." It will be in your recollection that the "Sydney" was the fast cruiser which followed and sunk the notorious "Emden"—whose commander, Müller, has just recently been repatriated—putting an end to her career of destruction. The whole episode was one of absorbing interest, and the prompt and swift punishment meted out by the "Sydney" in sight of the Cocos Island in the Pacific Ocean was very dramatic. The officers of the "Sydney" went to the hotel for dinner, and the inevitable band, which was one of the features of hotel life at Bermuda, and we had the good fortune to hear something of the incident of this sea-fight from them, although, like all naval officers, they were very reluctant to talk much about the matter. As they were just in Bermuda for coaling only, the next morning, from the high ground of the Bermuda golf links, we saw the "Sydney" steaming out towards the ocean.

Coming back to the history of Bermuda, the period following the Napoleonic wars, during which the maritime fortunes of Bermuda had taken a very prosperous turn—produced a reaction, and the prospect of farming did not appeal to the people who had been seeking prosperity on the sea, while the abolition of slavery did not help the rather lethargic land-owners. However, with the American Civil War the heyday of Bermudian prosperity commenced, and the huge profits of blockade running attracted adventurers to Hamilton and St. George's as their base of operation. For the four years of that war the Bermudas had a lively time with the various escapades of the blockade runners, and money was squandered by these reckless and desperate adventurers.

Since that time until this great War Bermuda's associations with the outside world have not been very active. During the Boer War some hundreds of Boer prisoners were taken there and housed on two or three of the small islands on the Hamilton Inlet. Generally the islands had been occupied in agriculture and market gardening, for their great but not very near neighbour, New York. The production of early vegetables and flowers for which the great American market was a source of profit to the island, is not now so profitable on account of the development of California and Florida, and from those States the development of rapid rail services has helped to supply with these necessities the great cities of the eastern seaports. One cannot help thinking that more

energy might be shown in the cultivation of the islands, as with New York 700 miles away—a run of 48 hours—their situation puts them in touch with that great market for early potatoes, onions, and Easter lilies, for which Bermuda is famous, and these are amongst their main articles of export.

The Bermudas are often spoken of as being in the West Indies; they have, however, no such connection, being well on to 1,000 miles away from the nearest members of that group, the Bahamas. The distance of New York is some 700 miles, and from the American coast of North Carolina, Cape Hatteras, about 100 miles less. The nearest British port is the Canadian city of Halifax, Nova Scotia, slightly further away than New York, being 750 miles.

Life runs easily in the Bermudas: bright skies, genial warm sunshine, not too hot, contrast with zero in New York, 48 hours away. Gaily clad visitors—American women in white and most of the colours of the rainbow—all bent on having a good time and getting it. Large, airy, roomy, well-appointed hotels in Hamilton, such as the “Princess” and the “Hamilton,” for the real Bermuda season, which may be described as lasting from November or December to April. The “Princess” has accommodation for about 400 guests, and the “Hamilton” for probably 500 to 600. At the “Princess,” which is alongside the sea, there are perhaps hundreds of yards of glass verandahs along the waterside, giving protection in the roughest weather. The colourings even of the occasional fires which in stormy weather cheer up the hotel residents, are remarkable. The fires are made of timber from wreckage, dried, flotsam and jetsam picked up around the island, which is found to be impregnated with salt and iodine, and when this timber is burnt in the large open hearths at the “Princess” it diffuses all the colours of the rainbow.

No fog, no frost, no extremes of temperature, no sudden changes, the island is sheltered from the extremes of Continental weather by the warm liquid barrier of the Gulf Stream. There is no humidity from the ground, and there is hardly any thickness of soil. Heavy tropical downpours occur at times, but the porous coral ground soaks up the torrents, and in a few hours all is dry again. Remember we are in the latitude of Morocco and abreast of the cotton belt in the Southern States, but there is no malaria. I am speak-

ing of the winter months: December, January, February, March, when outdoor life in Bermuda is just splendid. There is a heavy rainfall, taken on British measurement, probably about 60 inches, which is twice the rainfall of Manchester. There is splendid bathing from the south shore. The beautiful fine white and pink coral sands of Elbow Beach are remarkable. Swimming in the large salt-water open-air pool at the "Princess" Hotel, where the water is warmed on the cold days, is delightful.

All the wide expanse of ocean on the north side is full of coral reefs, extending out to the great barrier. These reefs can be well explored in the large glass-bottomed boats in which visitors are taken out to see them. This excursion is one of entrancing interest, and a description of the marvellous beauty is entirely beyond my capacity. It would puzzle a real artist in words to paint this picture as it reveals itself on a bright sunny morning in Bermuda. The beautiful blue sky, the shimmer of the water, the shades of the deep blues and greens always changing, the white coral just beneath the boat, and amongst all the foam of the reefs over which we are drifting, the submarine gardens with their sands and sprays, the anemones and weeds, springing from this coral foundation, and all through those delicate shades and brilliant colourings with the delicate texture of the coral amongst which are all those beautiful ferns and sprays, the fish are darting about, and in these transparent depths lies the octopus; the wonderful colourings of the angel fish, and the many other fishes to be seen in those depths—the parrot fish, rock fish, and that great delicacy the red snappa, and there is even the moire, or sea-serpent, which is an actual fact in these islands. On a good sailing day yachting in the enclosed waters of Hamilton Inlet or the sheltered area of the great sound is a joy and delight. The Bermudian coloured boatmen are smart handlers of their little craft, and there is generally a fair sailing breeze at some hour of the day.

Coral Island, the most northerly form of the Atoll, forms a chain of about 22 miles long from Ireland Island to St. George's. The smaller islands are connected to the main island by bridges, swing-bridge and causeway, and the roadway is continuous, so that on the excellent main roads which traverse the island cycling, riding, driving, enable the visitor to go everywhere. There are, however, restrictions in regard

to Ireland Island, where the Government dockyards and repair shops are erected. The central ridge, or backbone, runs along the wider part of the main island. Prospect Camp and Government House are on the main ridge of the island.

The roads are generally excellent, certainly all the main roads, which run the length of the island, the north and south side, and where the island is broad enough, in the centre also. The surface is hard and smooth, practically dustless, being just cut out of the coral. After the occasional heavy down-pours which occur the road surface very soon becomes dry again, and on all these white roads you can explore every part of the island on a bicycle. Excellent first-class bicycles in very good condition can be hired at the large hotels, or at one or two of the stores in Hamilton. As the machines always seem new, and are certainly kept in good condition, I think this is due to the fact that they are imported each season from England, and after being hired out for the season they are probably sold off to the native Bermudians and a fresh lot imported from England.

There are some steepish hills, but everywhere the roads are run through gently undulating country, with up and down grades. In many parts of the island the shade dells and rich green foliage remind one of quiet lanes in the South or West of England, and although there are no streams in the island, there being no gathering ground for them, we come across little dips in the road where it looks as though you might certainly find a little purling brook. As there are no streams in the island it may be asked where the water supply of Bermuda comes from? To this we may reply, there is no water supply and they have to rely entirely on the rainfall. Every house in Bermuda has its water cistern, or underground tank, for the collection of the tropical showers I have spoken of. From these tanks the water has to be pumped up into the house, and anyone who has taken a cottage in Bermuda will remember the round at the pump to supply the necessary requirements for domestic uses.

Numerous well-appointed carriages are attached to the hotels in Bermuda, and the well-trained, cheerful and obliging coloured drivers are good guides on the island roads. For communication between Hamilton and St. George's, and also to other parts of the island, an omnibus or stage-coach runs regularly, taking pretty nearly anything which the passengers

feel called upon to take. Motor cars do not exist, and are understood to have been specially forbidden by law. Steamer excursions to points about the Sound are constantly made, and occasionally to St. George's. Steam ferries ply to all points round Hamilton harbour—the Great Sound and down to the great dockyard on Ireland Island. Sailing boats, and even more pretentious yachts, are much in evidence on the fine days, and are manœuvred by their skilful Bermudian pilots round under the very walls of the Princess Hotel on good sailing days. Motor boats are beginning to be in evidence on these waters also.

I have mentioned the excellent roads, and I have spoken of their extreme picturesqueness, and especially where, as often occurs, they are bordered by hibiscus hedges and the poinsettias and bruxelles, all with their bright and characteristic colours, give great charm to excursions round the island.

Such cool weather as comes along in the winter arises from a long spell of strong breezes, amounting at times to a gale, blowing from the north shores, and sometimes the wind from this quarter is very persistent. We were unable to get away from the island on one occasion for days after the sailing date on account of the strength and persistence of one of these northerly winter gales. The steamer "Bermudian" could not then get out of Hamilton harbour as the strong breeze would have blown her off her course at the passage in the coral which I have previously described. Partly also the tortuous passage round the north side of the island to the sea, alongside the reefs, would have been extremely dangerous with a strong gale from the north.

I have mentioned some of the Bermuda amusements. Prominent amongst them is golf. At the Bermuda Golf Club, on the high land overlooking the north shore, the golf is varied, but the views seaward and over the island and harbour and the Sound are splendid. One of the few advantages we possess in Manchester over Bermuda is that we can grow fine grass against the coarse blade grass of this sub-tropical coral island.

Any Bermudian wishing to build a house has simply to cut out slabs of coral on his land, leave them exposed to the atmosphere for a while, and then construct his dwelling. You see, at places, throughout the island, this actually being

done, workmen just cutting out slabs of coral exactly like cutting cheese.

The West Indies cables costs 40 cents to New York.

The atoll form of Coral Island, with barrier reefs, enclosing a lagoon. Bermuda is the most northerly type of this.

The Gulf Stream is probably 150 to 200 miles across, and flowing at something like three or four knots, with a certain temperature of about 75 degrees, against probably 60 to 65 degrees in the neighbouring ocean. There are various theories as to the formation of coral island. Their foundations are sometimes believed to rest upon the top of submarine mountain ranges or upon the plateau in the ocean, or even upon extinct volcanoes, and these various theories have been accepted or discarded from time to time by the investigators. Probably alterations in the subsidencies of the ocean floor have permitted the coral-building animals to get to work at levels which suit their work best; anyway, there they are, working at the Bermudas, and their constructional work is going on all the time all along the great reefs, which means that at some time more or less distant they will also become islands.

No motor cars are on the island, no tramcars and no railways.

With the large and increasing American tourist traffic, it gives them a large purchasing public which they cater for, in addition to the islanders themselves. It is, moreover, a public well supplied with money, bent on a holiday, and with the small revenue tariff which is imposed by the Government, these same American visitors find imported articles very much less there than under the high tariff ruling in New York; consequently there is plenty of shopping.

I have spoken of the ample menu in the hotels; but as regards fruits, the islands do not seem to produce as much as one would have expected, although all sorts of sub-tropical fruits can be grown there, but the only fruit which is particularly in evidence is a delicious small banana, notable for its very fine flavour, but of this the production is not even enough to satisfy the home demand. The pawpaw is seen occasionally—a small fruit with a combination of the flavour of the peach and the banana.

Bermuda enjoys the possession of a Bishop, who combines the great island of Newfoundland with the little ones of Bermuda in his diocese, and divides his time between the two distant sections of his diocese. Prior to the establishment of this Bishopric in 1825 Bermuda formed part of the See of London, England—certainly a very distant branch of that famous diocese—to which it was attached from the reign of Charles the Second. It must be a pleasant transition from the icebergs and fogs of Newfoundland to the coral, sunny seas of Bermuda—as it were, “From Greenland’s Icy Mountains to India’s Coral Strand.” This association with the distant island was not satisfactory to the Bermudians, and in 1879 they were constituted into a bishopric themselves, but being a small community, they invited the Bishop of Newfoundland to take up the duties of their diocese. As the aged Bishop has recently died the Bermudians may have to combine their spiritual requirements with some other diocese on the mainland.

Bermuda is a Crown colony under the Governor, who is assisted by a Council elected by the islanders. There is a regiment of coloured soldiers, and from early in the War the Bermudian contingent of white volunteers was raised, trained and sent to England to take part amongst all the units which have rallied to the defence of their Motherland.

Communications by cable and with the mainland and with Europe is furnished by the Halifax and West India Cable running from Bermuda to Halifax, and from Bermuda to the distant West Indies. Cable communication with New York has to follow this circuitous route—there is no direct communications. The price of cabling discourages long communications, as the charge is 40 cents, or $1/8$ per word. In pre-war days that very much discussed Marconi wireless scheme which so disturbed political circles in this country had as one of its objects the erection of a high-power wireless station at Bermuda, such as the Germans erected in German Africa and elsewhere. Possession of this in the War would have been invaluable in the chase of the elusive “Karlsruhe,” and giving a hand in saving the many British ships which she destroyed. The construction of this wireless station is now being proceeded with.

Under the high cliffs there are everywhere cave formations, of which the largest are the crystal caves near to Harrington

Sound. Spacious galleries have been cut down to these, hundreds of steps lead down to these cavernous depths, where you see stalactites of remarkable formations, with the blue-green water around them.

Review.

"The Geology of the Lake District." By J. E. MARR, Sc.D., F.R.S.
Cambridge University Press. 12/- net, Illustrated. Maps.

GEOGRAPHERS are almost as interested in the geology of the Lake District as the geologists, and the geology of this country is the foundation of its geography. No one is more able to write on this district than Mr. Marr, who for many years has made a close study of its geology and structure. Such a complicated region of primary and volcanic rocks requires the experienced eye to detect some of the more awkward parts where the work of erosion and denudation has been carried on for long periods of time. The author shows that the various types of rock produce various types of scenery. The question of the age of the volcanic material is of more interest to the geologist than the geographer. The origin of the streams and tarns and the work of ice is a good feature of the book. The price of the book prohibits a large sale, though the general reader and ordinary tourist would gain much information from the maps and diagrams alone. It is a good idea in such a book to use two kinds of type, and the pictures, diagrams and maps are valuable. Dr. Marr is to be thanked by all those interested for his valuable work, and the publishers have issued a nice volume. It is a pity that the book could not be issued at a lower price so as to be more extensively read and studied.

T. W. F. P.

MYTHOLOGY AND MANKIND.

By Miss KATE QUALTROUGH, F.R.G.S.

(Addressed to the Society, in the Geographical Hall, on
Tuesday, March 5th, 1918.)

GEOGRAPHY is the physical basis of history, because the destinies of mankind are to a great extent carved out by their environment, *climate* determining their food (before extensive commerce had been developed), the *physical features* fixing their occupations, while the *aspects of nature* surrounding them, coloured and to a certain degree, suggested their ideas and beliefs.

Thus mythology is like geology, an intimate affinity of geography; for, just as in geological strata the fossils and the order of superposition tell of the ancient climates and the order of succession of the living races inhabiting the earth, so in myths and in language proof is found of the successive strata of human thought. When it is considered that very many if not the majority of mythical tales have been traced in more or less variant forms from nation to nation, they are at once proved by this wide diffusion to date from an immeasurably remote period. It is impossible to believe that they could have been preserved through these countless ages and prized by innumerable generations of human beings, if they were originally merely stories intended for amusement. The earliest which does not profess to be historical, belongs to that dim, far-away period when the matriarchal races first systematically practised in Southern India. They had to begin their work in the darkness of ignorance and the infancy of untrained faculties, and had to do tasks which would have fully occupied the time of practised experts, and it is impossible to believe that these busy practical people would have wasted their leisure time in framing tales merely intended for amusement. The physical tasks alone would have left no time for mere brain work unconnected with pressing wants. They had to learn, among other things by experiments, the rudiments of agriculture—how to turn wild grasses, vetches and

jungle roots (which were the parents of rice, millets, cereals, and root crops) into materials for food always available; to ascertain the times and seasons for sowing, planting and reaping their produce, and how to cultivate fruit trees. The result of their labours was shown in their elaborate myths, for they meant that the work which had cost them so much trouble should last and bear fruit in new improvements. They therefore did not content themselves with securing present comfort, but provided for the future prosperity of their children. As their descendants, the Indian Dravidians still do, they looked carefully after their education, believing that one of the most important tasks they had to fulfil was that of teaching the young of both sexes the knowledge they had acquired.

In every village the rising generation was trained by the mother and maternal uncles (without the intervention of the father), and it was from the teaching instincts thus developed that mythic tales arose. An analysis of them shows that almost all are connected with the explanation of natural phenomena, and that they are the product of the brains of agricultural or hunting races, who had keen mercantile instincts, for whenever these stories have individuals for their heroes they almost all turn on the idea that happiness must follow the possession of riches. Some are nature myths telling of the course of the year, a subject of vital importance to the farming tribes of prehistoric ages.

One of these tells how Persephone, the daughter of the barley mother Déméter, was carried off in the autumn and detained six months in the underworld of Hades. Another is its complementary form which in its earliest stage narrates how the god of spring, who brought the April showers, slew the dragon of winter which froze up the rain, both providing the information that through all the Southern Races for countless ages the year has been divided into two periods, each of six months, measured by the Pleiades.

As myths invariably travelled with the tribes that framed them, they prove valuable guides to the migrations of peoples, for wandering in search of better places must have been one of the first impulses of intelligent humanity. It does not follow that ignorance of geography affects history, because the less known of the subject the more influence it was likely to have over their destiny. A tribe or collection

of tribes, once started on a career of migration, would be guided by the natural features of the country through which they were passing, skirting the base of a chain of mountains or following the sea shore. Rivers formed the great highways, and regulated the direction of migratory peoples, therefore ethnology must always be studied with due reference to river systems. These pioneers of civilisation entered Europe by means of the Euphratean valleys to Asia Minor. Traversing the Caspian Gates, keeping north of the Black Sea by means of the Danube Basin and the Plain of Germany, the Carpathians formed the great promontory which divided the stream into two parts (for naturally the dividing line of the Alps would be avoided), this is proved by the establishment of the village system and the reproduction everywhere of the holy groves sacred to the gods of Greece, Rome, Palestine, and Asia Minor, together with the worship of the Dryads or spirits of the woods. Also it was their influence which sanctified the mother-tree—the palm of Babylonia, the fig tree of the Hebrews, the olive tree of Greece, the pine of the N. Finns, the sycamore of Egypt, the oak of England, and the ash tree of the Isle of Man.

Telloh was the earliest seat of the tree worship, and the walls being of great thickness show that the worshippers possessed a knowledge of the value of clay. The excavations on the site have resulted in the finding of the earliest information relating to the making of canals, tanks, and dams for regulating or storing water, and hence increase the agricultural wealth of the country. As early as B.C. 4,500 a system of cadastral survey and land valuation was instituted.

One bun-shaped tablet records the survey of an estate of seven fields. Each field has been carefully measured, the area calculated, the nature of the crop, with its estimated value given. Where land is fallow or of an inferior quality its condition is stated. On the reverse is a calculation of the amount at which the estate is assessed, and the rent paid for it.

Besides cadastral surveys, a most interesting series of plans of estates was also found, the first representing a small estate through which ran two canals, the land adjoining a field on the left. On the obverse is the endorsement presented by the scribe.

The next fragment found is interesting for the careful way

in which the scribe has denoted the river, and at the bottom are the words "the cornfield."

In another fragment a pond is denoted, and its measurements, but these Babylonian surveyors were able to draw plans of houses in addition to those of estates.

The mythology of the tree is written in the place names, those sure records of the past. In the names of the villages of Tiptree in Essex, Heavitree in Devon, Wavertree in Lancashire, Picktree in Durham, we have a reminder that villages must not be regarded as coming into existence as villages, but rather growing around the hut of the first settler, whose abode was called after the tree that shaded it.

The worship of the tree is shown by two hundred places being named after the ash—Ashton, Ashby, Ashworth, Ashwick, and the oak and the thorn are nearly as common. The birch gives name to more than fifty places, and there are sixteen named after the hawthorn in Yorkshire alone.

The scarcity of names referring to the pine or fir is an assertion that those trees were unknown at the time of the Roman occupation.

Trees played an important part in national life, being the meeting-places of the shire moots, and bore the names of the persons near whose dwellings they often grew. Such are the hundreds of Edwinstree in Hertfordshire, Crumbald's Ash in Gloucestershire. Naturally trees with peculiarities of growth, appearance or situation were often selected as the meeting-place—the Hundreds of Greytree in Hertfordshire, Webtree in Worcestershire, and Longtree in Oxon.

The casting of lots was performed (*Tacitus Germanica*) by the branch of a tree being cut into small pieces, all being distinctly marked, and thrown at random on a white garment. If a question of public interest were involved the priest performed the ceremony. With fervent prayers offered to the gods, his eyes devoutly raised to the sky, he held up three times each segment of the twig, and as the same marks rose in succession the decrees of fate were interpreted. The present-day festivals of the 31st October and 1st and 2nd of November, the May-pole dances, and the custom of Easter eggs are survivals of the matriarchal ages. While from their descendants, the Basques, this country received the name Britain, the word containing the Euskarian suffix *etan* signifying a district or country, it occurring also in *Acquitania*,

Lusitania, the ancient name of Portugal, Mauretania, as well as in the names of very many of the tribes of ancient Spain—the Cerrebanî, Cissetani.

The year of three seasons followed that of the early races—the seasons of sowing, flowering, and harvest of the barley-growing races of Asia Minor, the Iberian race, who looked upon national education as one of the most important tasks of internal policy. They found it necessary to improve and disseminate more widely the knowledge of the history and geography of the country, the results acquired by scientific research. These were embodied in myths based on the recurrence of the seasons, which is told in the numerous stories of the three brothers, the youngest of whom, the reaper of the harvest, is alone successful in his quest, and it is they which appear in the Cinderella myth and its variants, where the Prince, the young god of the new year, is wooed and won by Cinderella, the despised winter scrub, who defeats her gaudier sisters, the spring and summer, and leaves her glass shoe of winter ice as the sign by which she is to be found.

It is this mythical method of recording the movements of time which appears also in the Briar Rose, or Sleeping Beauty. It is she who is the year goddess awakened from her winter sleep by the kiss of spring—her fairy godmothers are thirteen—the number of months of the lunar year. But one of the golden plates was taken away, and only twelve remained at her christening to denote the twelve months of the newer solar year, which succeeded the lunar. Consequently the thirteenth godmother—the discarded month—was angry, and came in after the first eleven godmothers had given their gifts, to decree that the new-born year princess should prick herself with a spindle on her fifteenth birthday.

But besides the main incidents of the story there are accessories—the magic dresses, the animals which help the hero and heroine—and these additions are indications of the advent of other races, of the close alliance of a number of tribes, some of which believed in magic, and others which had domesticated animals. It was thus the age of the first great national confederation—the southern agriculturists (Mongoloid Mayalan) Iberian races of Asia Minor, fire worshippers of Phrygia, shepherd races of the Caucasus, who called themselves the sons of the Tortoise, whose lands were

watered by the Oxus, Indus, Jumna and Ganges, Ararat being the centre of these primeval races.

The geographical myth of the Tortoise, Ararat in the centre of its head while the body floated on the surrounding waters of the Black, Mediterranean, and Caspian Seas, is the most ancient idea of the science, as well as the Hindu conception of the Elephant resting upon the Tortoise earth.

But in the earliest picture writing we have some details of the geographical knowledge in this primitive age, country and mountains being represented, highlands, rivers and seas; huts and houses were built of reeds, which were divided into two portions, the inner room being the quarter of the women. Outside the house were gardens and fields, which were bounded by ditches or small canals. Irrigation was known, as well as the art of making pottery, and the sheep, goat, and dog were domesticated—the latter the companion of man and the guardian of his flocks.

Metals were known, silver being the first to be worked, and called the pure white metal, while copper was the next used by the Ural Altaic Finns, who are represented in ethnology by the prevalence of the brachycephalic type of skull among the Slavs and Rumanians, and in mythology by the legends which connect the knowledge of metals with a race of dwarfs who became the elves of the popular fairy tales.

The mythology of the Fish God is diffused among the American Indians, Scandinavians, Finns, Akkadians, Arabians, Assyrians, Iranians, Hindus, Japanese, and Chinese, and throws a remarkable light upon the early commerce of those races.

The myth was first developed in India, and had its origin in the apparent miracles of the birth of the fish from the life-giving rains. For it is there that water tanks formed by excavations or by throwing dams across the hollows between two hills on rising grounds are, though dried up every year by the heat of the dry season, found to be swarming with fish as soon as they are filled by the rains. These fish in reality have been hibernating during the dry season in the mud, but to the ancients, who had not investigated the true cause of the phenomena, the fish who thus came to life simultaneously with the advent of the rain, must have appeared as the heaven-sent offspring of the rain god sent on earth to teach his children.

On migrating from India to the Persian Gulf the myth was expanded, and appears in Babylonian literature as follows :

There was originally in Babylonia a multitude of men of foreign race who had colonised Chaldea, and they lived without order like animals. But in the first year (of the new order of things, the new dispensation) there appeared from out of the Erythrean Sea (the ancient Greek name for the Persian Gulf) where it borders upon Babylonia, an animal endowed with reason, who was called Ea or Gr. Oannes. The whole body of the animal was that of a fish, but under the fish's head it had another head, and also feet below growing out of his tail similar to those of a man, also human speech, and his image is preserved to this day. This being used to spend the whole day amidst men without taking any food, and he gave them an insight into letters and science and every kind of art—he taught them how to found cities, to construct temples, to introduce laws, and to measure lands; he showed them how to sow seeds and gather crops; in short, he instructed them in everything that softens manners and makes up civilisation, so that from that time no one has invented anything new. Then when the sun went down this monstrous Ea used to plunge back into the sea, and spent the night in the midst of the waves, for he was amphibious. Ea set down his revelations in books which he consigned to the keeping of men, and several more divine animals continued to appear at long intervals.

Who knows but that this alludes to the arrival of successive colonies, at different intervals, who taught the Turanian population a more orderly way of organising society and ruling it by means of laws and an established government, above all astronomy and mathematics, sciences in which the Shumer Accads were very deficient, while the later and mixed Chaldeans attained a very high perfection, so that many of their discoveries and the first principles laid down by them have come down to us, as finally adopted facts, confirmed by later science? Thus the division of the year into twelve months corresponding to as many constellations known as the twelve signs of the Zodaic, were familiar to them. Each month had thirty days, so they were obliged to add an extra month to get even with the sun again. But the new comers borrowed the Turanian method of counting—not

the decimal system but by dozens and sixties—the Chinese even to this day measure time by a cycle of sixty years, not in centuries. This was probably the origin, in Babylon, of the division of the sun's course into three hundred and sixty parts or degrees, and the day into twelve Rasbu or double hours, since the Râsbu answered to two of our hours, and was divided into sixty parts, which correspond to double minutes, while these again were divided into double seconds.

The Age of the Fish God is that of the society described in the "Arabian Nights" some thousands of years earlier than that of the Ommayad and Abbasid Caliphs when those stories took their present form, the peaceful though adventurous trader playing the principal part. In two of the stories the hero prince wishing to marry the princess whose hand is refused to him, attains his end by disguising as a merchant; also when a prince or man of high birth falls into misfortune and finds himself an unacknowledged outcast in a foreign country he becomes a trader. There is little or no mention of settled landowners holding large estates or of any distinctions of rank based on birth, so that such a society as is thus portrayed in which traders were the ruling class could only have existed in a universal time of peace, one in which the dominant interest was commerce between India, China and the islands of the Malay Archipelago on one side, and Syria, Egypt, and North Africa on the other, with its centre in the Persian Gulf, as shown by the Porpoise being the sacred fish of India.

In British mythology the Fish God is represented by the Quest of the Holy Graal dealing with a series of incidents of the life of King Arthur, who was, according to one myth, cast up as a babe by the sea waves, and is thus identified with the Fish God worshippers known in British ethnology as the Cymro, who built Stonehenge in the Bronze Age. The proof being the number of round barrows found immediately around it. The inner shrine was formed by an outer circle of thirty boulder stones topped by coping stones joining their summits. The Temple certainly depicted the annual course of the sun, for the thirty stones marked the thirty days of the month for the three hundred and sixty days of the year.

But one important detachment migrating from India appears to have taken possession of the small islands along the

Eastern shore of the Persian Gulf, staying there for several centuries, probably choosing this home on account of their seclusion and safety. There unmolested and undisturbed they developed a certain spirit of abstract speculation to which their natural bent inclined them—being great stargazers and calculators, two tastes which harmonise and are favourable to dreaming. As islanders they had time to do so, working out a religion beautiful in many ways, and full of deep sense, their priests dwelling in communities or colleges, one on every island. But there came a time when their homes became overcrowded, and detachments began to cross the water and land at the furthest point of the Gulf in the land of the great rivers, finding a people not unpractised in several primitive arts but positively barbarous in the presence of an altogether higher culture.

According to Herodotus the Phoenicians partook in a great migratory movement, and passed by their own free will from settlements in the Persian Gulf to the shores of the Mediterranean Sea. In fact, there seemed to be a perfect cataclysm at this time, 2,000 B.C., a descent upon the Persian Gulf and valleys of the Euphrates from all sides represented in Hebrew literature by the exodus of Terah and his family. But migrations are not always caused by racial unrest, but by climatic and geological changes. The Phoenician assertion that they left their native land through an earthquake gives some colour to the idea that marked changes in those directions may have taken place at that time. Alluvial well-watered plains would naturally attract desert nomads from Arabia and Persia, for these districts were in earlier times far better watered and more densely populated, and climatic conditions have reacted on the character of the country. The effects would naturally be more marked in mid-continental regions, and the immigration of nomads may have been caused by similar periods of aridity in Central Arabia. Both the Phoenicians and Arabians were keen astronomers, and introduced into Babylonia the measurement of time by the lunar month and also moon worship, and posterity is also indebted to them for the earliest known map of the world. Considering that the Phoenicians were essentially a practical commercial people founding the great trade routes, overcoming perils and dangers of a thousand kinds by the force of an indomitable will, their mythology was not of an elevating

character, quite at variance with their geographical treatises and books of travel.

Originally they seemed to have possessed a lofty idea of the Supreme Power, calling him El (great) Ram or Remmion (high) Baal (Lord) Moloch supreme, but the different names passed by degrees into different gods, new deities being imported or invented with commercial relations, Ishtar from Babylon, Thoth and Ammon and Osiris from Egypt, for they adapted themselves to the most diversified forms of human life.

Islands, because of their relatively limited area and their clearly defined boundaries, are excellent fields for the study of mythology and ethnology, aloofness and pronounced individuality being the national characteristics of an islander; in fact, an islander is an island himself. Safe, tranquil, incommunicable, hating innovation, glorifying their habitude, always searching for a precedent to justify and countenance each forward step, they have led the world's march to progress.

Insular protection was undoubtedly the greatest factor in the brilliant cultural development of Candia or Crete, recent discoveries proving that the school of Ægean civilisation was there.

Borrowing the seeds of culture from Asia and Egypt, Crete nursed and tended them through the Neolithic and Bronze Age. As early as 3,000 B.C. it included an impressive style of architecture and a decorative art as beautiful as that of modern Japan.

In 1,800 B.C., seven centuries before Phœnician writing was heard of, the island had matured a linear script out of an earlier picture writing, so that it has the distinction of having invented the first system of writing ever practised in Europe.

It is round Minos that the bulk of the Cretan mythology gathers—the name being not so much the name of a person as that of a race of kings like Pharaoh and Cæsar given to all Cretan kings of a certain type. But the meaning of Minos is measurer, and showing their descent from the Minyæ, the great irrigating race of Orchomenos, Arabia, India, and Egypt.

The Minos most familiar in legend is the great sea tyrant, the overlord of the Ægean. Thus the first of men who recognised the importance of sea-power and used it to establish the

supremacy of his island kingdom, making himself master of the Hellenic Sea, ruling over the Cyclades, expelling those corsairs of antiquity the Carians, and put down piracy, a necessary step in order to secure the revenues for his own use. The place names called after him, and found from Sicily in the west to Gaza in the east, bear testimony to the garrisons and trading stations founded in his era, for the Cretans were shipbuilders long before the Egyptian Queen Hap-situ.

Cynosius, Cnossus, or Knossos, the royal city of Crete, was centrally situated on the north coast (possessing two ports, Heracleum and Amnisus), and as long as the war fleet of Minos was in being it needed no fortifications; it was her fate, for no expedition of any size could force a landing in the island. If the fleet failed there was no second line of defence. There is every evidence that it did so at last. The manifest marks of a vast conflagration, perhaps repeated more than once during the long history of the Palace, and the significant fact that vessels of metal are unknown upon the site, while of gold there is scarcely a trace.

Near the main north entrance of the palace was found a plaster relief of a great bull's head, which had once formed part of a complete figure, the eye having an extraordinary prominence: its pupil is yellow, and the iris a bright red, of which narrower bands again appear, encircling the white towards the lower circumference of the ball.

The Cretan monster with human body and bull's head, to whom young men and maidens were sacrificed, was the Semitic Moloch. The Labyrinth is the palace, a great part of the ground plan itself, with its long corridors—successions of blind galleries—tortuous passages and spacious underground conduit, the bewildering system of small chambers does in fact represent many of the characteristics of a "maze."

That the sport of the bull-ring and bull grappling was an established and habitual form of Minoan sport is proved by the multitude of representations of it which have survived, the victims being the captives brought back by the great king from his voyages of conquest. It was essentially a Semitic sport, and introduced by the Phœnicians in their colonisation (the place names testifying to their number).

It still survives in the bull fights of Spain, for that country

seems to have been first known to the Phœnicians as the land where the skins of martens were procured; in fact, the name Hispania is the Phœnician *Span* denoting an abundance of those animals.

Probably the Iberic mariners either in their own ships or in those of their Punic masters coasted along to Brittany, from thence to Ireland and Britain, in some dim prehistoric period, establishing an Iberic colony in Cornwall, where under Phœnician supervision, they worked the tin mines and smelted the ores. They called the islands the Cassiterides, and related of the inhabitants that they were clad in black cloaks and in tunics reaching to the feet, with girdles round their waists; that they walked with staves, and were bearded like goats, subsisting by means of their cattle, and for the most part led a wandering life.

That the worship of Baal was introduced seems certain from the place names. Balearic Isles, Balerium, the ancient name for Land's End, Bel Tor, Mis Tor, Ham Tor, Belan in Montgomeryshire, Belan near Newtown, Belan Banks in Shropshire, the Baal Hills in Yorkshire, similar to the Belch mountains in the Vosges and Black Forest. Start Point is from Ashtaroth, to whom sacrifices were also made, the victims being put into a leather bag, the origin perhaps of the wicker baskets in which the Druids encased captives before burning them.

Dyeing, originally the staple industry of Phœnicia, was introduced at this time. How the Tyrian dyes were originally discovered is a matter for conjecture. The popular tradition upon the subject will scarcely at the present day be regarded as historical. According to this Hercules, the Phœnician god, was one day walking along the Syrian shore in company with a nymph with whom he was in love, and followed by a favourite dog. It found a specimen of the murex lying on one of the rocks, its head protruding from the shell, whereupon he seized it and devoured it, colouring his mouth with the juice. When Tyrus saw the beauty of the tint she fell into such an admiration of it that she told Hercules she must positively refuse his suit until he brought her a garment of the same hue. Thus stimulated, the hero set himself to collect a number of similar shell fish, and having extracted from them their colouring fluid, succeeded in obtaining enough to dye a robe, which he presented to the lady of his affections.

The story has some merits, for dead shell fish thrown up by the sea may have disclosed their colouring as they lay upon the shore or even have stained the mouths of those that fed upon them, whether dogs or birds. Primitive peoples are always fond of bright colours, and the red or purple hues once noted would be soon applied either to stain the bodies or the clothes of those whose attention had been attracted to it.

But the mythology of all the early civilisations was the outcome of their environment within and adjoining the Tropics, where the physical features are most sublime and yet most terrible, Nature is in every respect most dangerous to mankind. Indeed, generally speaking, in Asia, Africa and America the external influences are more formidable than in Europe. Constant and serious dangers increase the activity of the imagination, and human power failing, super-human power is called in, and the belief aroused of a deity that must be appeased. One compares Greece and India the reverse of each other.

The works of Nature which in India are of startling magnitude are in Greece far smaller, feebler and in every case less threatening to mankind. In the great centre of Asiatic civilisation the energies of the human race were too confused and intimidated by the surrounding phenomena, for besides the dangers incidental to tropical climates, there are those noble mountains which seem to touch the sky, and from whose sides are discharged mighty rivers which no art can divert from their course, and which no bridge has ever been able to span; impassable forests; whole countries lined with interminable jungle, and beyond them dreary and boundless deserts, all teaching to man his own feebleness and his inability to cope with natural force.

Without and on each side are great seas ravaged by tempests far more destructive than any known in Europe, and of such sudden violence that it is impossible to guard against their effects.

As a result their gods are deities that must be appeased. One sees how the threatening aspects of the external world so filled the minds of the people that they strove to produce them in a visible form, for to them they owed the leading peculiarities of their natural culture.

In Greece the aspects of nature are entirely different.

Nature was less dangerous, less intrusive, and less mysterious, therefore the human mind was less appalled and less superstitious. Natural causes began to be studied. Physical science first became possible, and man gradually awakening to a sense of his own power sought to investigate events with a boldness not to be expected in Asiatic countries, where mythology was based upon terror.

The Greeks had learned to overcome nature, therefore their gods were always represented in forms entirely human, for no artist would have gained attention if he had presumed to portray them in any other shape. He might make them stronger than men; he might make them more beautiful, but still they were men.

The analogy between the deities and mankind which excited the religious feelings of the Greeks would have been fatal to the Asiatic. The men of Europe, encouraged by the safety and inertness of the material world, did not hesitate to strike a parallel generalising their observations of the human mind and applying it to the gods.

In architecture the same principle was at work, the dangers of the tropical civilisation being shown by the temples being huge buildings, often constructed with great skill, but showing an evident desire to impress the mind with fear, and offering a striking contrast to the lighter and smaller structures which the Greeks employed for religious purposes.

The mythical and religious motive is also ever present with the early potters, for the mind guides the hand; in fact, it enters into every phase of human life. Works of national importance, such as the drainage of marshes, that of the Argives being the historical foundation of the legend of Hercules overcoming the Hydra.

More surprising than all in many respects was the complete system of drainage with which the ancients provided their palaces, the gradient of the hills which underlay the domestic quarter of the palace of Knossos enabling the architect to arrange for a system which would be hard to match in Europe until the middle of the nineteenth century of our Era.

The Romans have been described as the road makers of the world, their public ones being accurately divided by mile-stones, and running in a direct line from one city to another with very little respect for the obstacles either of nature or

private property. Mountains were perforated, and bold arches thrown over the broadest and most rapid streams. The middle part of the road was raised into a terrace, which commanded the adjacent country, and consisted of several strata of sand, gravel, and cement, and was paved with large stones or in some places near the capital with granite. But the Minoan roads were without doubt the models on which they worked, and Hercules' passage over the Alps was in reality the record of travellers over the Phœnician commercial land route, with its attendant dangers.

It is remarkable how the habits of mythology and political conditions of the Arcadians were influenced by the physical characteristics of their country. The poverty of the soil and severity of the climate necessitated a pastoral rather than an agricultural life, hence their love of music and their devotion to Pan, the inventor of the pipe, and Mercury, the god of the lyre.

The ancients carefully noted any phenomena connected with rivers—streams which disappeared for a space beneath the earth, as the Eudeas, Orontes Meander, a circumstance which gave rise to the poetical idea of the union of distant streams, as of the Alpheus with the fountain of Arethusa in Sicily. The legend of the contest between Hercules and Achelous for the hand of the daughter of Cœneus being based upon the efforts of the inhabitants of the River Achelous to restrain it within its bounds by dykes and dams.

Great changes were observed to have taken place on the sea coast through the amount of mud and sand brought down by rivers, the plains of Cilicia being due to the alluvial deposits of the Sænis and Pyranus.

Herodotus knew the Caspian as a distinct sea, but does not mention the Sea of Aral, so that it has been conjectured that the Caspian Sea extended very much more to the East, so as to include it, and the appearance of the country favours the idea. But it has nevertheless undergone great changes, the Gulf of Rol Derya on the east coast having extended far over the alluvial flats to the eastward, receiving the Oxus by a course which may still be traced.

Myths, when rightly used, are valuable aids to the historian, specially when verified by archæology. Theseus slaying the Marathon bull and the Trojan War marks the

conflict between the Aryan and Semitic races, the end of Semitic despotism, for probably from land hunger the Aryans started from and over-ran from North-West Europe and North-West Asia towards the close of the Bronze Age. To them the ruler of heaven was the sun that warmed the earth, and they introduced a new era when the individual and not inexorable fate became the arbiter of events, and the true king was born leader of an assembled and united people, for both their rulers and the rank and file of their army belonged to those north-west races who based property on individual and family possession and not on the communal system of the southern village races, hence individuals are always of more importance in the north than in the south. The Reformation was the refusal by the north to accept the religion forced upon it by the south.

A race of warriors to whom military glory and personal distinction were the objects of ambition could not be contented with the historical methods of the races who looked on history as a help to national progress and not as a record of individual prowess. The northern conquerors did not care to be entombed in histories which did not record their names, and thus preserve the memory of each individual chief—being intensely proud of their families—and in every ruling one the ashes, deeds and names of their ancestors were preserved in the ancestral home and in the songs and genealogies compiled by the bards. It marked a new era in mythology, the transformation of the old historical myth into living history, and ultimately became the parent of Greek poetry and art and the spirit of individuality. The Trojan War is an example of mythology and archæology aiding the historian. The city of Troy owed its importance to its situation commanding the trade route between the Eastern and Western Mediterranean. The site has been identified with the mounds of Hissarlik, and the ruins of seven successive towns superimposed one above the other have been found, the lowest settlement of the later neolithic age, the next built on the ruins of the first at a level of eleven to twenty feet. Above it was a strongly fortified city which had been destroyed by fire, and which answers almost exactly to the Troy of Homer.

The citadel hill had been enclosed by massive walls, and was surrounded by a stately palace and other buildings, the foundations of which remain.

The ostensible cause of a war is always some point of honour; the ultimate cause is almost without exception economic, and that of Troy verifies this statement. It is an example of a city occupying a central position between two trade routes and using that advantage for the accumulation of her own wealth and to the detriment of everybody else, especially a small nation (Greece) whose land could not provide sustenance for its own people, its only outlet being the Hellespont (blocked by the enemy) which brought her vital supplies of food from the Euxine corn fields. Immigrants were pouring in rapidly from the north, so expansion was more than necessary. More exasperating still was the fact that individual voyages of discovery had been made, for the Legend of the Argonauts contain a vague record of the facts, but they are so interspersed with fairy tales that the Argo passes beyond the range of tangible geography once the Euxine Sea is reached.

Troy was the centre from which radiated all the lines of commerce, the trade route to the Euphrates, that which came westward across the highlands of Persia from Turkestan to the Asiatic Plateau. The caravan route that led sometimes to Trebizond, bringing the precious jade from Turkestan and the carpets from Persia. One of the routes by which mythology brought the gifts of the Hyperboreans to Greece passed through Scythia, indicating a trade route from the Baltic to the Black Seas.

The existence of such an extensive trade is proved by the diffusion of gold found in the vaults and tombs buried under the débris of the ruined city; it must have come from abroad, for it is not a native product, as also the bronze, copper and tin; in fact, the catalogue is an account of the trade routes in those prehistoric times. The great cause of the war was the need for commercial and colonial expansion.

The wooden horse is an engineering device, for no one can have stood at the foot of the great Mycenaean walls at Hissarlik without feeling that if ever they were scaled by Achaians it must have been with the aid of some contrivance like the wheeled towers of the Assyrians drawn close up to the walls and disgorging upon them their hidden freight of warriors. Is it not the common habit to give such mechanical military aids the names of animals? The crane is a familiar example, and the analogy of the ram is even closer.

The results of the explorations at Mycænæ, the abode of Agammemnon, has been to show that a still larger and more wealthy city existed there for a longer period than Troy, and which affected a more extensive area, for its peculiar art and civilisation were widely diffused from Greece to the shores of Asia Minor. The city of Mycænæ also owed its importance to its situation on the Isthmus of Corinth, connecting the trade routes of the Eastern Mediterranean with the Western Sea and Europe. It is singular that ancient history (Egyptian) is known from its hieroglyphics; Chaldea and Assyria from the cuneiform writing in clay tablets, but the other civilisations have left no inscriptions. This is the more remarkable in the case of Troy and Mycænæ, for their date is not very remote. Their jewellery vases and signet rings are profusely decorated, their dead interred in stately tombs with large quantities of gold and silver, and yet not a single instance has been found of anything resembling alphabetical or symbolical writing of any description.

But mankind also records by means of mythology—where written history is silent—the records of physical changes, when the place names become beacon lights of geologic history, for they are mythic history.

But the recollection of the fallen power of the earliest lords of the ocean were to the Greek mind those connected with oppression, and therefore not recorded in their mythology, and it is thus left to that of the Egyptians to do justice to the great ones of Crete (Minoan) in the legend of the lost Atlantis. Their tradition being that long ago there had been a great island in the Western Sea where a wonderful central power held sway not only over the whole of its own land, but also over other islands and part of the continent. In an attempt at universal conquest this island state made war upon Greece and Egypt, but was defeated and overwhelmed by the Athenians, and overwhelmed by the sea as a punishment for its sins, leaving only a range of mud-banks, dangerous to navigators, to mark the place where it had been.

Plato describes the great harbour, elaborate with its shipping and its merchants coming from all parts, the elaborate bathrooms, the stadium and the solemn sacrifice of the bull, all thoroughly though not exclusively Minoan, but when one reads that it is done with staves and nooses it is an unmis-

takeable description of the spot at Knossus which amazes all foreigners.

The boundaries which Plato assigns to the Empire are practically identical with those over which Minoan influence is now known to have spread. The island was the way to other islands, and from these you might pass to the whole of the opposite continent which surrounded the true ocean, answering to the modern description of a half-way house between three continents, flanked by the great Libyan promontory and linked by smaller island stepping-stones to the Peloponnese and the mainland of Anatolia.

The only difficulty in the way of accepting the identification is that it is also stated that the lost Atlantis lay beyond the Pillars of Hercules, but this might be an endeavour on the part of the writer to accommodate the ancient tradition to the wider geographical knowledge of his day for the old Egyptian conception of the universe held that the heavens were supported on four pillars, which were actual mountains. To the men of the 18th century B.C. the sudden blotting out of Minoan trade and influence seemed as strange and mysterious as if it had been swallowed up by the ocean.

Review.

"Greece Before the Conference." By POLYBIUS. Methuen, 5/- net.

Pp. xxvi+120. Preface by T. P. O'CONNOR, M.P., and ethnological map. THIS book is by a scholar who knows his subject, and argues his case closely, dispassionately, and with moderation. The argument is based chiefly upon statistics of population as it was in 1910 to 1912, taken often from unfriendly sources. No part of the author's case rests upon purely historical grounds.

The opening chapter explains the attitude of Greece before her intervention in the European War, and maintains that Constantine did not represent the Greek people. It explains that the tardiness of Greek mobilisation after the Venizelist triumph was due to the failure of the Entente Allies to supply equipment, and points out that the Greeks supplied more than half the allied troops on the Balkan front, and that these troops fought well. It makes clear that, in spite of the treachery of Constantine's régime, Greece has a claim on the gratitude of the Allies.

The remaining chapters discuss the claims of Greece to Western Thrace, parts of European and Asiatic Turkey, the Dodecanese and Northern Epirus. It is shown that the Bulgarian claim to Macedonia and Thrace on historical grounds is extremely bad; Bulgarian power south of the Balkans existed for only 51 years out of 774; it points out the proved inability of the Bulgars to rule subject populations, and insists on the moderation of the Treaty of Bucharest of 1913, which actually gave Greece fewer Bulgars than it left Greeks under Bulgarian rule. It makes out a good case, ethnological, cultural and commercial, for the Greeks to hold Western Thrace. The chapter on Turkey suggests the annexation of part of Turkish Thrace to Greece, the setting up of a self-governing republic on both sides of the Straits, including Constantinople, and the annexation to Greece of the vilayets of Aidin (including Smyrna), and Broussa (less two Turkish sandjaks). Intermigration of Greeks from Turkish territory and Turks from Greek territory is seriously suggested, and the author thinks that where both populations are agricultural no great difficulty would be experienced in carrying it out.

The last two chapters deal with Italian and Greek counterclaims. The Greek claim to the Dodecanese is not a matter for argument; the Dodecanese is Greek. As regards Northern Epirus, in spite of the author's arguments, in spite of the unpleasant way in which the Italian claims have been manufactured, it is not quite clear that the whole country should go to Greece. There is something to be said for some of it being left to the Moslem part of Albania.

The final chapter on "Greece as a factor in the Orient" sums up many statements made in the body of the book, and claims that Greece has shown herself the most enlightened power in the Eastern Mediterranean; so that, in cases of doubt, Greece should be given the benefit. The Greeks are more advanced in education, in commerce and in government. They have the incalculable advantage of possessing in Venizelos a statesman who combines the great qualities of Cavour with many of those of Mazzini. Above all they have the tolerance that comes from travel. The Turk is not allowed by his religion to rule a subject race; the Bulgar has absorbed many of the worst qualities of his former Turkish masters and has added to these the vices of Prussia. Where these countries are concerned, the Greek should always be given the preference. As for Italy, her friends hope that her imperialism, easily explicable from her history, is but a phase; only let her forget Austria and remember the traditions of Piedmont, and she will find that she can be friends with both Jugo-Slavs and Greeks.

Proceedings of the Society.*

January 1st to December 31st 1918.

The 1,054th Meeting of the Society was held on Tuesday, January 8th, 1918, at 7.0 p.m. Mr. George Ginger presided.

The Minutes of the Meetings held on December 11th and 18th were taken as read.

The Chairman invited the members to attend the lecture to be given at the University on Monday, January 14th, by Mr. Phythian on "Venice," for the benefit of the refugees from the Venetian district.

Mr. J. Ernest Phythian delivered a lecture entitled, "Italy: Divided, United, Unredeemed," and illustrated with lantern slides.

A hearty vote of thanks to Mr. Phythian was passed.

The 1,055th Meeting of the Society was held on Tuesday, January 15th, 1918, at 7.0 p.m. Mr. E. W. Mellor, J.P., F.R.G.S., Presided.

The Minutes of the Meeting held on January 8th were taken as read.

The election of Mrs. Seddon as an Associate Member was announced.

Mr. Wm. Stern, C.C., gave a lecture, entitled: "Glimpses of Russian Turkestan." His remarks were illustrated with a large number of lantern views, of which all were taken by himself. (See p. 9.)

Alderman J. R. Ragdale, J.P., moved, the Chairman seconded, a resolution, passed unanimously, of thanks to the lecturer.

The 1,056th Meeting of the Society was held on Friday, January 18th, 1918, at 3.30 p.m. Mr. E. W. Mellor, J.P., F.R.G.S., presided.

The Minutes of the Meeting held on January 15th were taken as read.

The Rt. Rev. Monsignor Kelly gave a lecture on "Spain," and his remarks were illustrated with many lantern views.

The Chairman moved, and Mr. W. T. Anderson, M.I.M.E., seconded a hearty vote of thanks to Monsignor Kelly; the resolution was passed unanimously.

The 1,057th Meeting of the Society was held on Tuesday, January 22nd, 1918, at 7.0 p.m. Mr. J. Stephenson Reid presided.

The Minutes of the Meeting held on January 18th were taken as read.

The Chairman reported that the Society had lost two members by death, and a resolution of sympathy with the relatives of Messrs. J. H. Greenhow, Norwegian Vice-Consul, and G. W. Nichols was passed by all rising.

Professor G. Elliot Smith, F.R.G.S., gave a lecture on "From the Persian

* The Meetings of the Society were held in the Geographical Hall unless otherwise stated.

Gulf to the Yenisei." The address dealt especially with the ancient travels along this route before the days of written history, and was illustrated with lantern maps and views.

A hearty vote of thanks was passed to the Professor

The 1,058th Meeting of the Society was held on Tuesday, January 29th, at 7.0 p.m. Mr. J. E. Balmer, F.R.G.S., presided.

The Minutes of the Meeting held on January 22nd were taken as read.

The deaths of Mr. J. H. Greenhow, Norwegian Consul, and Mr. G. W. Nichols were mentioned by the Chairman, who announced that letters of condolence had been sent to their relatives by direction of the Council.

The Rt. Rev. Bishop Welldon, D.D., Dean of Manchester, gave a lecture on "Climate and Character in India." The address was illustrated by several wall maps of India and Asia and by two lantern slide maps of India.

The hearty thanks of the meeting were given to Bishop Welldon for his very interesting address.

The 1,059th Meeting of the Society was held on Tuesday, February 5th, 1918, at 7.0 p.m. Mr. R. A. Staniforth presided.

The Minutes of the Meeting held on January 29th were taken as read.

Mr. Samuel Wells, F.R.G.S., gave a lecture on "The Outgoing Turk: Turkey yesterday and to-day," and illustrated his remarks with many fine coloured lantern views.

On the motion of the Chairman the thanks of the meeting were given to Mr. Wells.

The 1,060th Meeting of the Society was held on Friday, February 8, 1918, at 7.0 p.m. Members of the Manchester Branch of the Geographical Association were also invited. Mr. E. W. Mellor, J.P., F.R.G.S., presided.

Dr. Wm. Wilson, F.R.A.S., gave a lecture on and explained the working of his "Models illustrating the Motions of the Sun, Earth and Moon."

Dr. Wilson pointed out that no orrery could be correct to scale, if required to be used in ordinary class-rooms, and in a portable form as is essential for educational purposes, and indicated to what extent his principal model was exaggerated. He showed how his model explained the natural phenomena of day and night, the year, the seasons, the phases of the moon and the changes in the appearance of sun spots, also solar and lunar eclipses which it differentiates into total and partial in the case of the moon, and total, partial and annular in the case of the sun, and also the changes in appearance, position and apparent course of the sun spots due to the sun's rotation on its inclined axis.

He set the model in motion, and demonstrated the earth's daily rotation round its axis and yearly revolution round the sun, the monthly revolutions of the moon round the earth combined with one rotation round its own axis during the same period so that the same side is always turned towards the earth. The model showed the tilt of the moon's path to the plane of the ecliptic, but for which there would be an eclipse every new and every full

moon; it also showed the way in which the nodes, or points of intersection, at or near which alone eclipses can take place, themselves change their places, making a complete round of the moon's path in eighteen years and eleven days (a journey which the model performs correctly to a day, or with an error of 1 in 6,600, this marvellous accuracy speaks volumes for the perfect mechanism of the model).

The model was completed in the autumn of 1917, a year of special astronomical interest as containing the maximum number of eclipses possible, namely, 7, and consequently a good year for testing the accuracy of the model. An Almanac supplied the date of the first eclipse of that year (Jan. 23), and on the model being placed accordingly and slowly turned round it demonstrated that solar eclipses must have occurred on June 19, July 19, and would occur on Dec. 14, and on again referring to the almanac these experimentally predicted dates were found to be correct to a day, and if these solar eclipses were capable of being correctly demonstrated it is obvious the three lunar eclipses of that year must equally correctly have been demonstrated by the model, though unfortunately attention at the time had been limited to eclipses of the sun, no notice being taken of eclipses of the moon. Then after a completion of the 18 years and 11 days, the succession of eclipses would begin again, the same kinds at the same intervals. He learned during his long residence in China that the Chinese in ancient times had by observation found out this period of 18 years and 11 days.

Dr. Wilson also explained some subsidiary models and diagrams, one of which showed the way in which the varying distances of the moon from the earth (thus varying its apparent size) affected eclipses, and in this connection mentioned that the paths of moving bodies in space were never circles but ellipses, and the central body was always in one of the foci.

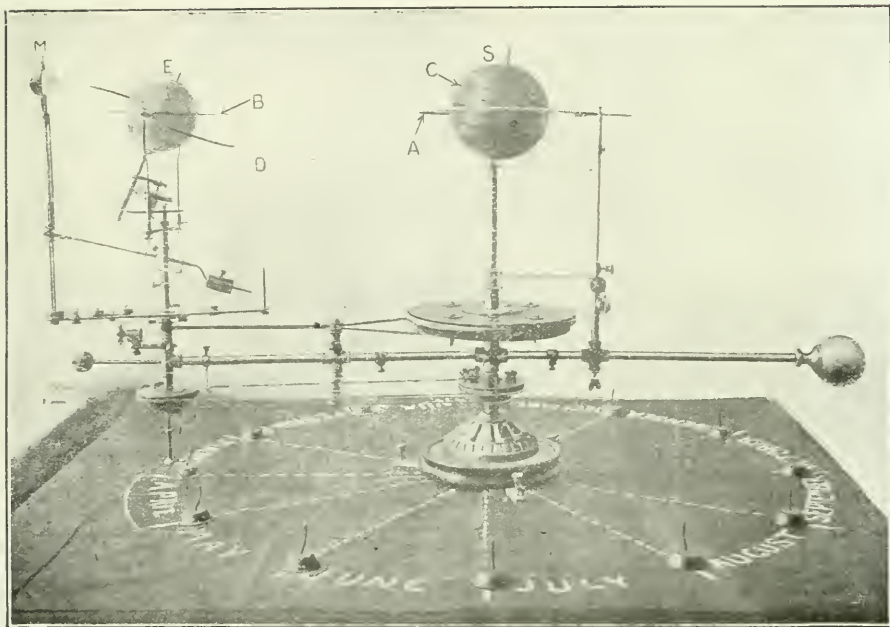
He then described the mechanical devices which he had employed in the construction of the model, laying special emphasis on the motions being conveyed by pulleys and cords with special arrangements for keeping the tension constant during varying weather conditions.

He finally showed how each of the numerous motions could be demonstrated separately, thus greatly adding to its value for educational purposes.

Mr. T. W. F. Parkinson, M.Sc., F.G.S., in moving a resolution of thanks to Dr. Wilson, said how useful such a model would be for teaching purposes, and that it would depend on the cost as to the possibility of its general use in schools.

Colonel H. T. Crook, D.L., in seconding the resolution, praised the ingenuity with which the half-dozen motions had been arranged on one spindle with inner supplementary spindles, and said that the design and construction of the model gave evidence of the engineering capability of Dr. Wilson.

The Chairman, in putting the resolution, which was carried unanimously, mentioned that the wonderful opinions in praise of the model which he had previously read, were fully justified by the results which he had witnessed, and he had learnt with interest that the lecturer had as a doctor devoted thirty years of his life to benefiting the bodies and souls of the Chinese and in teaching them the elements of science.



Astronomical Model, designed for use in Schools and Colleges
by William Wilson, M.B., C.M., F.R.G.S.

The 1,061st Meeting of the Society was held on Tuesday, February 12th, 1918, at 7.0 p.m. Mr. J. Stephenson Reid presided.

The Minutes of the Meetings held on February 5th and 8th were taken as read.

The Chairman announced that the Council had elected Mrs. J. Howard Reed an Honorary Member.

Professor P. M. Roxby, B.A., F.R.G.S., gave a lecture on "Manchuria and Korea," and illustrated his remarks with lantern views taken during his visit to those countries.

A hearty vote of thanks to the lecturer was passed.

The 1,062nd Meeting of the Society was held on Friday, February 15th, 1918, at 3.30 p.m. Mr. E. W. Mellor, J.P., F.R.G.S., presided.

The Minutes of the Meeting held on February 12th were taken as read.

Mr. T. A. Edwards, F.R.G.S., gave a lecture on "Southern Rhodesia: a White Man's Country," and illustrated his remarks with many fine lantern views, all of which with the exception of half-a-dozen were from his own photographs.

The Chairman moved a resolution of thanks to the lecturer, and it was carried with acclamation.

The 1,063rd Meeting of the Society was held on Tuesday, February 19th, 1918, at 7.0 p.m. Prof. W. B. Anderson, M.A., presided.

The Minutes of the Meeting held on February 15th were taken as read.

The Rev. Hugh Morrissey, M.A., gave a lecture on "Tusculum and its Surroundings." Reference was made to Albano, Nemi, Monte Cavo and the Castelli, with the Campagna beneath; also to Soracte, Tivoli and Palestrina in the Sabines across the Campagna. The address was illustrated with a large number of lantern views, almost all of which had been taken by the lecturer.

Mr. George Ginger moved, the Chairman seconded, and it was resolved that the hearty thanks of the meeting be given to the lecturer.

The 1,064th Meeting of the Society was held on Tuesday, February 26th, 1918, at 7.0 p.m. Mr. R. A. Staniforth presided.

The Minutes of the Meeting held on February 19th were taken as read.

The election of Mrs. M. J. Woodhead as a Life Member, and of the Rev. Hugh Morrissey, M.A., as an Ordinary Member, was announced.

Mr. J. Herbert Cooke gave a lecture on "The Remote Bermudas," and illustrated his remarks with lantern views. (See p. 18.)

A hearty vote of thanks to Mr. Cooke was unanimously passed.

The 1,065th Meeting of the Society was held on Tuesday, March 5th, 1919, at 7.0 p.m. Mr. J. Stephenson Reid presided.

Miss Kate Qualtrough, F.R.G.S., gave a lecture on "Mythology and Mankind," and illustrated her paper with lantern views, many of which had been specially prepared. (See p. 32.)

A hearty vote of thanks was given to the lecturer.

The 1,066th Meeting of the Society was held on Tuesday, March 12th, 1918, at 7.0 p.m. Captain W. C. Bacon presided.

The Chairman mentioned the loss by death of the following members :— Major P. K. Glazebrook, M.P., Messrs. G. S. Woolley and R. Stewart, and a resolution of sympathy with their relatives was passed.

The election of Mr. James A. Brooke as an Ordinary Member was announced.

Mr. T. A. Edwards, F.R.G.S., gave a lecture on Southern Rhodesia : a White Man's Country," and illustrated his address with many lantern views, almost all of his own taking.

On the motion of the Chairman, a hearty vote of thanks to Mr. Edwards was unanimously passed.

The 1,067th Meeting of the Society took the form of a Joint Meeting with the Geographical Association, and was held on Thursday, March 14th, 1918, at 7.0 p.m. The Rt. Rev. Bishop Welldon, D.D., as President of the Manchester Branch of the Association, and as Vice-President of the Society, presided.

This meeting and the following one were arranged in connection with the first Meeting of the Council of the Association out of London, forming part of a series of meetings arranged to celebrate this event.

After a short address by the Chairman on the Progress of Geography in Education, the Rev. A. W. Fox, M.A., gave a lecture on "Clough, Moor and Fell," dealing with the Lancashire and Yorkshire Borderland. He illustrated his address with a large number of lantern views.

Mr. T. W. F. Parkinson, M.Sc., F.G.S., moved, and Colonel H. T. Crook, D.L., J.P., seconded, a resolution of thanks to the lecturer, which was passed unanimously.

The lecturer, in responding, moved that the thanks of the meeting be given to the Chairman for his interesting address.

The 1,068th Meeting of the Society was a second Joint Meeting with the Geographical Association, and was held on Friday, March 15th, 1918, at 8.0 p.m. Professor P. M. Roxby, B.A., F.R.G.S., presided.

Professor H. J. Fleure, D.Sc., F.R.G.S., Hon. Secretary of the Association, gave a lecture on "Regional Survey."

Prof. Peak moved, Mr. R. A. Staniforth seconded, and it was resolved, that the hearty thanks of those present be given to the lecturer, and that the Society and the Association be requested to consider the advisability of taking action locally.

The 1,069th Meeting of the Society was held on Tuesday, March 19th, 1918, at 7.0 p.m. Alderman J. R. Ragdale, J.P., presided.

Mr. A. E. Collyer gave a lecture on "Mexico and the Mexicans," and illustrated his remarks with lantern views.

The Chairman moved a resolution of thanks to the lecturer, and it was passed with hearty applause.

The 1,070th Meeting of the Society was held on Tuesday, March 26th, 1918, at 7.0 p.m. Mr. R. A. Staniforth presided.

The Chairman announced the election of Sir G. W. Agnew, Bart., M.P., as an Ordinary Member.

A number of lantern slides were shown on the screen giving particulars of important additions to the Library, and it was announced that the nine volumes which were on exhibition on the Chairman's table, had just been presented by Miss Kate Qualtrough, F.R.G.S.

Mr. Ewin Pickstone gave a lecture entitled "Rambling Awheel," giving an account of his journey from Stafford to Monmouth and back to Manchester through nine counties. His remarks were illustrated with a large number of lantern views, mostly from his own photographs.

On the motion of the Chairman an appreciative vote of thanks was tendered to Mr. Pickstone for his address.

ANNUAL MEETING, 1918.

THE 33rd Annual Meeting of the Society was held, by kind permission, in the Lord Mayor's Parlour, Town Hall, on Thursday, May 9th, 1918, at 3.0 p.m.

The Right Hon. the Lord Mayor (Sir Alexander Porter, J.P.) presided, and was supported by the Lady Mayoress, Mr. Harry Nuttall, M.P., F.R.G.S., President of the Society, and Mr. E. W. Mellor, J.P., F.R.G.S., Vice-Chairman. There were also present:—Miss Blanchoud, Mrs. Charnock, Mrs. Potts, Miss Renshaw, Mrs. Harry and Master Charles Eli Sowerbutts, Mrs. Stordy, Mrs. Wilkinson (of Ardwick), Mrs. Wilkinson (of Oldham), Messrs. C. Battersby, Bayfield, G. Blackshaw, W. S. Buckley, Richardson Campbell, C. A. Clarke, J. Herbert Cooke, T. A. Edwards, F.R.G.S., Theodore Gregory, J.P., F.C.A., — Goodwin, J. Howard Hall, F. B. Osborne, M.A., J. Stephenson Reid, Sidney Smith, Harry Sowerbutts, A.R.C.Sc., T. W. Sowerbutts, F.S.A.A., R. A. Staniforth, Tafel, George Thomas, J.P., and J. A. Walker, with others.

Apologies were received from the Right Rev. Bishop Welldon, D.D., The Vice-Chancellor of the University, Messrs. R. Kay, F.R.G.S., A. Ree, Ph.D., and Arnold Williams, A.C.A.

The Minutes of the 32nd Annual Meeting held on May 11th, 1917, were taken as read, being printed in the "Journal" (Vol. XXXIII).

The following Annual Report and Balance Sheet were submitted by the Secretary :—

REPORT OF THE COUNCIL.

FOR THE YEAR ENDING DECEMBER 31ST, 1917.

THE Council have pleasure in reporting that, notwithstanding the national crisis, the work of the Society has been carried on with a great measure of success during the year.

The weekly meetings held during the winter months have been fairly well attended, and the Council desire to express their thanks to all those who have given valuable help.

An innovation during the year has been the holding of afternoon meetings for the convenience of those members who are unable to attend the evening meetings, and the result has encouraged the Council to continue this development.

The interesting and instructive character of the lectures delivered will be seen from the following list :—

- "The Structure of the Northern Pennines." Mr. A. Wilmore, D.Sc., F.G.S.
- "By Meadow, Lane and Stream." Mr. J. D. Berwick.
- "Our Cathedrals." Mr. Arthur A. Bellingham.
- "Wales in Bye-Gone Ages." Mr. H. F. Northcote.
- "In County Cork." Rev. A. W. Fox, M.A.
- "The Russian Revolution and Kerensky." Mrs. Brodsky.
- "On the Russo-Rumanian Front." Miss E. L. Broadbent, M.A.
- "Round About Lake Geneva and Chamonix." Rev. J. H. Burkitt.
- "The Snow-Clad Alps." Rev. J. H. Burkitt.
- "Spain." Rt. Rev. Monsignor Kelly.
- "In Greece and some of the Islands in the Ægean Sea." Mr. John B. Gass, F.R.I.B.A., J.P.
- "Constantinople." Mr. J. Ernest Phythian.
- "The Holy Land Yesterday and To-day." Miss Sophie Nicholls, M.A., F.R.G.S.
- "Some Impressions of North China." Mr. P. M. Roxby, B.A., F.R.G.S.
- "What I saw in Old Japan." Mr. John Hilditch, F.R.G.S.
- "The Coloured Races of South and East Africa." Mr. T. A. Edwards, F.R.G.S.
- "Life in Alaska and the Yukon." Miss M. G. Hindshaw.
- "Tasmania : Australia's Switzerland." Rt. Rev. Bishop Mercer.
- "The Earth and Its Ice-Clad Poles." Mr. H. F. Northcote.
- "The Growth of the British Empire During Last Century : Economic." Mr. A. Williams, A.C.A.
- "The Internationalization of Mankind." Rev. F. C. Smith, M.A., F.R.G.S.
- "Ancient Mariners." Professor G. Elliot Smith, F.R.S.

The Journal for 1916 has been issued during the year as an annual volume (Vol. XXXII).

Valuable additions to the Library and Map Collection have been made during the year, full particulars of which are given in the Journal.

The remaining 40 Volumes (making 70 in all) of the Mr. and Mrs. Eli Sowerbutts' Memorial deserve special mention, as also does the donation of Mrs. Walkden and family to provide for the addition of Books relating to Africa to the Library as a Memorial to the late John Walkden; 22 Volumes have so far been obtained for this Memorial.

Great improvement has been taking place in General Education during the year, and there are hopes for further progress in the future. The Council have taken action which may help to remedy the seeming neglect of Geography in this improvement, and trust that success will meet the efforts of themselves and others, who are also moving in the matter.

The services given by the Victorians in lecturing are greatly esteemed.

The Council greatly deplore the loss by death of the following members :—

Madame M. Adnett.
 Mrs. J. Allen.
 Mr. A. Blass.
 Alderman I. Frankenburg, J.P.
 Mr. E. H. Hamp.
 Alderman W. T. Heap, J.P.
 Sir W. H. Houldsworth, Bart.
 Rt. Hon. Sir L. S. Jameson, C.B.
 Mr. Moritz Kalisch.
 Colonel Jesse Pilcher, V.D.
 Alderman J. H. Thewlis, J.P.
 Mr. W. J. Tyne.
 Miss A. H. Woolfenden.

Sir W. H. Houldsworth, Bart., was an Original Member.

The Council deeply sympathise with those members who have suffered bereavement by the death of their relatives in the war.

The following Members of the Society are now serving or have served in His Majesty's Forces :—

Colonel E. W. Greg, J.P., C.C., F.R.G.S.
 Colonel S. L. Mandleberg, J.P.
 Major A. England, R.A.
 Major P. K. Glazebrook, M.P. (Killed in action).
 Major E. Johnson, J.P.
 Major E. Keith Roach.
 Captain W. Morton Johnson, F.R.G.S. (Killed in action).
 Captain L. E. Mather, F.R.G.S.
 Captain G. R. Mellor, M.C.
 Captain R. W. Swallow, B.Sc.
 Captain Norman Zimmern.
 Lieut. C. V. Groves, R.N.
 Lieut. Wm. Robinow.
 Lieut. G. R. Swaine.
 Sub-Lieut. H. C. Handcock, R.N.R.
 Sergeant H. Shorrocks.
 Dr. Edgar Grey.
 Mr. F. Clay.
 Mr. Harry Herd (died during training).
 Mr. Arthur Holt.
 Mr. B. Jordan.
 Mr. E. Lightowler.
 Mr. T. H. B. Sowerbutts.
 Mr. Charles Sutton.
 Mr. A. W. Wood.
 Mr. W. D. Woods.

The Council will be pleased to receive intimation of any omissions from this list.

The Balance Sheet for the year, with the Report of the Honorary Auditor, is appended.

It will be seen that there is a deficiency of £52 14s. 8d. on the Revenue Account for the year.

The number of members on December 31st, 1917, was 634, being a net decrease of 14 during the year.

Additions to the membership are urgently needed to take the place of members who have had to withdraw owing to the war, so as to enable the work of the Society to be carried on as efficiently as possible.

BALANCE SHEET, DECEMBER 31ST, 1917.

LIABILITIES.

	£	s.	d.
To Sundry Creditors	69	9	9
„ Subscriptions Paid in Advance	49	7	0
„ Life Membership Reserve Account	210	0	0
„ Investment Depreciation Account	451	11	4
„ Kirkpatrick Endowment Fund	50	0	0
„ Eli and Emma Sowerbutts Memorial Fund :—			
Shares in Building Co.	150	0	0
„ J. Walkden Memorial Fund, Balance unexpended	6	6	0
„ Balance as at December 31, 1916	398	3	7
Add Trans. from Inv. Depn. Account.....	9	13	8
	407	17	3
Less Deficiency for 1917	52	14	8
	355	2	7
	£1,341 16 8		

NOTE.—The Furniture, Fittings, Books, Maps, Slides, Stock of Journals, etc., which are insured for £1,000, are not included as Assets in the Balance Sheet. There are 49 Life Members (of whom one is Honorary), and the subscriptions of 28 of this number have been taken as revenue in years prior to 1908.

I have audited the above Balance Sheet and certify its correctness. I have also examined the Certificates for the Shares in the Building Company, and found them in order.
27th April, 1918.

THEODORE GREGORY, F.C.A.,
Honorary Auditor.

ASSETS.

By 172 Shares of £10 each fully paid in the M.G.S. Building Co. Ltd. as under :—			
110 Shares presented	1,100	0	0
62 Shares purchased	211	11	4
	1,311 11 4		
„ Subscriptions in Arrear		11	11 0
„ Cash in Bank	7	3	1
„ Cash in Hand	2	0	7
	9 3 8		
„ Sundry Debtors		9	10 8
	£1,341 16 8		

REVENUE ACCOUNT.

YEAR ENDING DECEMBER 31st, 1917.

1916.	£	s.	d.
76	14	5	To Expenses of Meetings, less Receipts for Special Lectures
70	1	11	" Journal, less sales and advertisements
151	18	4	" Rent, Lighting and Insurance
110	10	0	" Salaries
195	1	8	" Wages and Sundry Expenses
4	6	1	" Commission and Expenses, New Members, and Collection of Subscriptions
8	14	5	" Books, Maps, Binding, &c., Library
—	—	—	" Repairs to Furniture
—	—	—	" Education Committee's Expenses
			£546 9 8

	£	s.	d.
1916.			
By Members' Subscriptions :—			
Life (Transferred to Reserve Account)	10	10	0
Ordinary	409	10	0
Associate	55	13	0
Societies	10	10	0
	475		13 0
" Dividend on Shares in Building Co.	16	14	0
" Bank Interest	1	8	0
" Income Tax Refunded	—		—
" Deficiency, carried to Balance Sheet	52	14	8
	£546		9 8

The Lord Mayor, in moving that the Annual Report and Balance Sheet be received and adopted, said that he thought the Society fulfilled a very useful part in the life of the city. The subject of Geography formed a most interesting study, not only because of the pleasure and profit to be derived from it, but also because in a great commercial centre like Manchester it had a very close connection with our industries and our manufactures. It was rather surprising that there had not been in the past more interest taken in the subject by those responsible for the education of children. However, of late years, a change was coming over the spirit of those who had to do with education, and the importance of geography was being recognised both in our elementary and in our secondary schools, and the subject was being taught on more scientific lines and on more interesting lines than formerly. He remembered that when he was at school the subject of geography was often a dry catalogue of rivers, mountains, and the principal cities, leavened now and again by the drawing and colouring of a map. But nowadays a great deal more human interest was thrown into geography. The walks and excursions on which children were taken by teachers, for example, afforded opportunities for illustrating how islands were formed, what effect rivers had on the surface of the country, explaining the contours of the land, and many other useful and interesting things.

Before the war he had some correspondence with a Government Department (he rather thought it was the Colonial), and learned that it had a very large number of excellent lantern slides, prepared at great cost and with great care, of the different parts of our Empire. The scheme the Department had in mind was that the lantern slides should be sent to various education authorities and shown throughout their schools. The Department also had prepared descriptive matter connected with the slides. The idea was an excellent one. He supposed those slides were now all stored away in some Government office in London. Whether they would be brought out after the war to help forward the study of geography in our schools he did not know, but he thought that both with the lantern and the cinema there was a great field for education, especially in the matter of geography.

In the secondary schools there was an attempt, at any rate in Manchester, to put geography on a still higher plane and

to have it studied from a purely scientific point of view. He was sorry to say that this had not received the encouragement he thought it ought to have done from the Board of Education. Along with Sir Thomas Shann and Mr. Spurley Hey he went up to the Board to interview Mr. Fisher and members of his staff on the question of the inclusion of geography in the curriculum of special courses for which grants were made. The authorities in London ruled out geography. Now at the Manchester Municipal Secondary Schools the teaching of geography was on highly scientific lines, and they claimed that geography was a science as taught in those schools, and that therefore it ought not to be excluded from the subject for which a special grant was made. He thought they would succeed in their claim. At any rate, they had the support of all education authorities in the country and every city like Manchester, and he thought the study of geography on the lines stated was eminently useful and ought to be encouraged.

Mr. Harry Nuttall, M.P., F.R.G.S., President of the Society, who seconded the resolution, said:—We are all indebted to the Lord Mayor for the remarks he has made about geography taking a more prominent place in education than it has done in the past. I hope his words will reach the Board of Education. A number of us have been hammering away at this subject with the object of getting geography put into such a position in the secondary schools that it shall cause men to obtain appointments and thus lead to a demand for teachers who aspire for higher positions reaching the University. If a chair, or special studies for which degrees were given, were established at the University, we would thus have spreading from the universities over the country more efficient teachers of geography. Unless, in the secondary schools, this subject is more prominent you cannot get people to give attention to the subject, and you will not, therefore, have teachers and those who aspire to the higher ranks in the educational world taking it up.

As regards the report, which the Vice-Chairman will deal with later, I am sure you will join with me in expressing sorrow at the sad losses we have sustained during the past year. First, there is Sir William Houldsworth, one of our original members, a most highly respected citizen of Manchester, who has passed away full of years and honour. On the field of battle we have lost Major Glazebrook, M.P., a

brave officer who gave his life for his country. We have lost others, I cannot name them all here, but among them are Colonel Pilcher, a very old friend of mine, Alderman Heap, Alderman Frankenburg and Alderman Thewlis, all old and respected members of our Society.

Notwithstanding the war, which now affects nearly every part of the world, explorers and geographers have displayed their usual enterprise, activity, and industry in every direction. We find that they never slacken their energies whatever happens. Geographers are, I think, the most active people in the population of this globe. The activity of the Germans is a remarkable feature, on which I shall have something to say a little later.

Africa, a limitless field of work, has been the scene of much enterprise and labour. Surveys of the northern and southern watersheds of the Congo have been made by Major C. Christy and Major E. A. Steele. Surveys of Northern Uganda were carried out by the late Captain Leeke. The Imatong-Agora Mountains east of the Upper Nile on the Uganda-Sudan boundary have been explored by Mr. H. P. Wright. Not only has General Smuts captured German East Africa in a brilliant manner in the face of the greatest difficulties as regards transport and climate, but he has made valuable geographical observations in that country, the result of which he communicated to the Royal Geographical Society in January of this year. He reminds us of the pleasant climate of the inland African plateau 4,000 or 6,000 feet above the sea level. It is a part of the world well worth study and examination, and General Smuts tells us of its possibilities for the cultivation of maize, cotton, coffee, millet, and other products, while the lower lands nearer the coast would yield rubber, rice, copra, etc. That inland plateau extends roughly over an area from the Zambesi to the borders of the Sahara, and it is only one example of the enormous undeveloped resources of the world which await man's peaceful enterprise and industry. In Canada there are large areas capable of producing wheat to an extent sufficient to supply the whole world if we had the labour. Then there is the undeveloped area of Siberia, from which country were obtained minerals and food of various kinds, and which is capable of becoming a large wheat growing area. As a result of our occupation of Mesopotamia we are restoring the fertility of that ancient land by bringing into use the

system of irrigation which had been planned and partly developed by British engineers, but neglected by the Turks. Three hundred thousand acres have been brought under cultivation, and the produce will not only give supplies to our troops, but will relieve our transport system and release shipping for other purposes.

The Tibesti highlands, north-east of Lake Chad, have been partially explored by Major Tilho, a French officer; and in spite of the occupation by the Union forces of German South-West Africa, a German traveller, Dr. F. Jaeger, has continued his researches in the northern part of this former German colony.

In America, a Canadian mountaineer, Professor Coleman, has made a fresh ascent in the Torngat Mountains of Labrador. In New Guinea, Dr. A. Wade has continued his surveys in Southern Papua, and an enterprising Swede, Dr. Eric Mjöberg, proposes to carry out further exploration of this large island by an aerial expedition. Captain Amundsen, who had planned an Arctic expedition across the North Polar Basin, has had to postpone it on account of the war. A remarkable thing that he told me was that his principal object in undertaking his South Polar expedition was to provide means for an expedition to the North Pole. He looked upon his South Pole journey as a rather easy job.

Now, as to German activities in Europe; since the enemy occupation of the Balkans several German scientific men have carried out geological and other explorations in Serbia, Macedonia, and Albania. Important plans for the improvement of communications have been projected, including a proposition to construct a canal to connect the Danube and the Rhine. These plans show that our enemies are not going to allow any grass to grow under their feet.

We have done great things in the development of the world and have been so anxious to prevent exploitation of the natives by private capitalists that, as an ex-Indian judge, a member of the House of Commons, told me, we have almost unduly checked enterprise in India. But that is all on the right side. We had better not go too fast if it means more private exploitation which may lead to taking away the natural rights of the natives.

All improvements of communications are, however, to be encouraged if they are to be used for peaceful purposes, and

these and other objects, such as a reduction of armaments to a police force, we hope to see accomplished by a League of Nations. Of course, if canals are to be used for submarines, we shall need something like a military police of the world to control nations which attempt to bring about disturbances.

We have now before Parliament a new Education Bill, and after an active connection with this Society for thirty-two years I feel more and more impressed with the importance of the branch of study which we of this Society have done all we could to further and to help. The continual drawing together of the nations by the increasing rapidity of travel makes mutual knowledge more than ever necessary. As the speed of travel may now be reckoned as three or four times greater than in the pre-railway and pre-steamship era, the circumference of the earth may be measured in time as one-third or one-quarter of its previous extent. We see the globe shrinking before our eyes, and when we have aerial navigation fully developed, we shall be able, perhaps, to spend a week-end in India. The principal journeys of exploration during the past year show not only the ceaseless activity which is proceeding, but that from this very activity a knowledge of geography and all that it covers is a necessary preliminary to all progress. Shakespeare said: "Home-keeping youths have ever homely wits." Then in one Kingsley's novels, "Westward Ho," one of the characters says to another: "Then stay at home and grow all over blue mould." Well, everybody cannot travel, but our argument as geographers and educationists is that those who cannot travel should have the fullest geographical knowledge at their disposal in the course of their education. I should like to see every child, when of sufficient age, taught by means of a large terrestrial globe and some good maps. I would give him a large view of the world to begin with, and point out the principal features of the world, the oceans and the continents, the great mountain ranges of North and South America, the Alps in Europe, the great mountain barrier of Northern India, and the great rivers which flow from those mountains. Then I would rouse interest in the different peoples and their languages, and indicate their positions on the planet. Thus you would, I think, awaken a general interest which would be a fine basis for education in every direction.

Geography existed before history; include in your curri-

culum as much history as you can, but make geography the foundation, accompaniment and keystone of all study and knowledge.

Adventure in exploration, which means an increased knowledge of the surface of the earth, its inhabitants and its products, has always preceded or been concomitant with the advance and rise of nations. It was the case with Spain and Portugal, and in England it was the period of the greatest enthusiasm for exploration that, through appealing to the imagination, was most prolific in literature and poetry, as shown in the works of Shakespeare, Spencer, and other great writers. In spite of the war the Germans are displaying great activity in geographical research, and this means activity in other directions in the future. The watchwords of geographers have always been action, progress, and industry. The industry of men of genius has been simply enormous, and that has always been the attribute of nations which develop and progress. Enterprise and travel give a wide general view, which enlarge the mind and are, I believe, the first necessary condition for stimulating the intellectual faculties and giving a grasp and understanding of all the possibilities, intellectual, spiritual, and material, to be aimed for and achieved in the life of man on this planet.

I do hope that we shall have a more prominent position given to the study of geography, that it shall take a better place in our national education, and that we shall have a staff of university men to spread geographical knowledge, to supply teachers for our secondary schools, and also to fill chairs of geography at the universities. At present we are most concerned that geography should be recognised as the beginning and foundation of all mental work. There can be no doubt that geography and a broad general knowledge of geography form the first stepping stone and foundation to full and complete education.

Mr. E. W. Mellor, J.P., F.R.G.S., in supporting the resolution, which was carried, said that they were up against a loss of £52 in the working of the last twelve months. He could assure them that the Society had been run with the greatest economy, so much so that members of the Executive wondered whether they were not doing "cheese-paring" a little too much. But in spite of that the syllabus was one of the finest the Society had ever put before its members. The loss,

considering the work they had done, was not great, but it was exercising the minds of the Committee, because they could not keep on adding loss year after year and carry out the work of the Society as they would wish it to be done and as a Society with the prestige of a city like Manchester ought to do. A great many members were serving with His Majesty's Forces. They could not ask them for subscriptions, they were only too proud to count them as members, so their subscriptions were in abeyance. A number of members had been lost by death. Members could help the Society a great deal by getting their friends to become members. They would get full value for their subscriptions. It had been discussed whether they should ask members to give an extra five shillings on top of their subscriptions, or a shilling or two more, and the Committee was considering the wisdom of that.

The library had had a good year. There had been numerous additions to it, and it was a source of great satisfaction to the Committee to see the library increasing in works of such value that it would form a reference library of great assistance to members.

The Secretary, before submitting the nominations for the Officers and Council, said that, as the President remarked, geographical explorers were busy even during the war, and he wished, as evidence of this, to draw attention to two new wonders of the world which had been visited and brought to public notice during the last few months. They are "The Valley of Ten Thousand Smokes" in Alaska, and "The Guayra Falls" on the River Parana in South America; of both of which there were full accounts in the library. There would only be time to refer to the former. The South-West of Alaska is probably the most active volcanic region in the world, and the eruption of Mount Katmai in 1912 was one of the greatest volcanic explosions ever recorded. Mr. R. F. Griggs was the leader of the National Geographic Society's Expeditions of 1915 and 1916 to investigate the results of this eruption, and in the latter year he discovered the "Valley of Ten Thousand Smokes." In 1917 he explored this valley in which there are thousands, even tens of thousands, of columns of steam, rising to a height of from 500 to 1,000 feet before dissolving.

The Secretary reported that the retiring Officers and Council had been nominated, together with the Vice-Chancellor of the

University (Sir Hy. Miers, D.Sc.), Sir G. W. Agnew, Bart., M.P., and Sir E. Tootal Broadhurst, Bart., D.L., as Vice-Presidents.

Mr. J. Herbert Cooke moved: "That the Officers and Council, as nominated, be elected." He said that all the members felt that the efforts of the Officers and Council had been most successful, and they were delighted with the varied and extensive programme which had been arranged, and the endeavours to keep the Society in the front rank. When they had a real educational system and real geographical instruction as part of that system, the Society's efforts would have to be still further widened. In the present war hundreds of thousands of our young men were learning geography at first hand, and they would surely show a much keener interest in geography than they did before. Some of them would be as familiar with Bagdad as with Blackpool, and with the Alps as with Scafell.

Mr. C. Battersby, of the Eccles Co-operative Society, who seconded the resolution, which was passed, observed that the Manchester Geographical Society was undoubtedly doing a great work, and on behalf of his own Society he wished to say that they would do all they possibly could to assist it.

Mr. Richardson Campbell proposed, and Mr. C. A. Clarke seconded a resolution, which was unanimously passed, giving the best thanks of the Society to Mr. Theodore Gregory, F.C.A., J.P., for his services as Honorary Auditor, and re-electing him. Mr. Campbell mentioned that this was the thirty-third time Mr. Gregory had been elected.

Mr. T. A. Edwards, F.R.G.S., moved that the best thanks of the meeting be tendered to the Right Hon. the Lord Mayor for the use of the Hall and for presiding. In view of the importance of geography, said Mr. Edwards, it was very cheering to the Society to find its Annual Meeting recognised by the municipal authority and to be allowed to hold that meeting in the principal civic building in the city.

Mr. J. Stephenson Reid, in seconding the resolution, which was carried with acclamation, said that as a schoolmaster he thanked the Lord Mayor for his interesting address and encouraging words to those who were trying to teach geography and inculcate a love of it in the rising generation. He hoped that the Lord Mayor and others would not allow ardour to be cooled by some of the rebuffs from educational

authorities, but would go on emphasising the need of geographical instruction. The teaching of geography was absolutely necessary for an intelligent commercial population.

The 1,071st Meeting of the Society was held on Tuesday, October 1st, 1918, at 7.30 p.m. Alderman J. R. Ragdale, J.P., presided.

On the motion of the Chairman, a resolution of sympathy with the relatives of Messrs. Robert Guest and A. C. Russell, members who had passed away since the last meeting, was passed.

The Chairman announced the election of the following members:—
Ordinary: Mrs. T. A. Edwards, Mrs. R. A. Staniforth, Sir John S. Randles, M.P., Messrs. T. O. Jacobsen, M.P., F.R.G.S., R. F. Crosland, J.P., W. W. Adam, and James Ashworth; Associate: Miss Eva Pearson, Miss Nora Doyle, and Miss Dornsey Rees.

Colonel H. T. Crook, D.L., V.D., gave a lecture on "British Cartography during the War," illustrating his remarks with an exhibition of maps received by the Society in the last four years. This included maps presented by the Geographical Section, General Staff Office, especially the 62 sheets of the International Map on the scale of 1 in 1,000,000, which were arranged in position on the wall, and the map of German East Africa (1/1,000,000) with samples of the maps of Western Europe (skeleton map); Belgium and France, 1/100,000; Balkans, 1/250,000, etc. Also maps by Bartholomew and Stanford. (See p. 1).

Mr. R. A. Staniforth moved a resolution of thanks to Colonel Crook, and the Chairman, in seconding the resolution, added the Society of Architects for their kindness in lending the expanding trellis work to which the maps were attached; the resolution, as amended, was passed.

The 1,072nd Meeting of the Society was held on Tuesday, October 8th, 1918, at 7.30 p.m. Mr. George Ginger presided.

Mr. Nathaniel Jepson gave a description of "A Cruise to the Azores, Canary Islands and Madeira, with Calls on the Way." The address was illustrated with lantern views of Santiago, Lisbon, Algeciras, Gibraltar and the Islands.

A hearty vote of thanks to the lecturer was passed.

The 1,073rd Meeting of the Society was held on Tuesday, October 15th, 1918, at 7.30 p.m. Mr. E. W. Mellor, J.P., F.R.C.S., presided.

The Chairman announced the election of the following members:—
Ordinary: Messrs. G. Lindsay, J. Pearson, F. Walker, A.M.I.E.E., and T. Wilkinson; Associate: Miss G. Barlow, Miss N. Furnston, Mrs. D. Grime, Miss M. Hayes, Miss J. P. Haylock, Mrs. K. I. Miller, Miss J. Parkinson, Miss Julia Robinson, and Mrs. Jessie E. Toft.

He also reminded the members of the appeal for donations to eliminate the deficiency, and trusted each would help.

Mr. Walter Sanderson, J.P., gave a lecture on "By Train to the Land of the Midnight Sun." He illustrated his address with a large number of lantern views from his own photographs.

The Chairman, on behalf of those present, tendered appreciative thanks to the lecturer for his interesting address and for the slides.

The 1,074th Meeting of the Society was held on Friday, October 18th, 1918, at 3.30 p.m. Mr. J. E. Balmer, F.R.G.S., presided.

The Rev. A. W. Fox, M.A., gave a lecture, entitled: "Clough, Moor and Fell." The address dealt with the Lancashire and Yorkshire Borderland, concluding with a reference to the Brontë family, and was illustrated with many lantern views, mostly original.

A hearty vote of thanks was accorded to the lecturer.

The 1,075th Meeting of the Society was held on Tuesday, -October 22nd, 1918, at 7.30 p.m. Colonel H. T. Crook, D.L., V.D., presided.

In accordance with the request of the Chairman, a resolution of condolence with the relatives of two deceased members was passed: Mr. E. Makin, an Original Member, who was drowned by the torpedoing of the "Leinster," and Mr. T. F. Wilkinson.

It was resolved that Mr. C. H. Bellamy, F.R.G.S., receive the congratulation of the meeting on behalf of the Society for his happy deliverance from German control.

Lieut. W. Leonard Flinn described "Journeys in Persia," after giving a general account of the country and its people in ancient and modern times, and illustrated his remarks with a large number of lantern views from his own photographs.

The large gathering of members and friends passed a cordial vote of thanks to Lieut. Flinn.

The 1,076th Meeting of the Society was held on Tuesday, October 29th, 1918, at 7.30 p.m. Mr. J. Stephenson Reid presided.

The Chairman read the following letter from Mrs. Bellamy:—

Hull, October 26th, 1918.

Dear Mr. Sowerbutts,

Many thanks for your letter and enclosed note from the Geographical Society. My husband will deeply appreciate it, and it shall be given to him as soon as he comes over or mentioned to him when we can communicate with him. We hear this morning that he was seen about the 18th or 19th; he was well but very thin. My son Basil was taken away two days before the evacuation.

With kind regards,

Yours sincerely,

(Signed) M. ADA BELLAMY.

He also announced the election of Messrs. H. Evans, H. Marsden, and R. Robinson as Ordinary Members.

Mr. Samuel Wells, F.R.G.S., gave a lecture on "Unknown France, or the Deserts of Southern France." His address was illustrated with 100 original photographic lantern views of picturesque castles, quaint churches, relics of prehistoric times, ravines, gulfs, caves, canons and cirques, with costumes, customs and characteristics of the dwellers of the limestone and chalk plateaux of Les Causses, Aquitaine, Perigord, etc.

A very hearty vote of thanks was accorded to the lecturer.

The 1,077th Meeting of the Society was held on Tuesday, November 5th, 1918, at 7.30 p.m. Mr. T. W. F. Parkinson, M.Sc., F.G.S., presided.

The Chairman mentioned the sudden death of Mr. Peter Knowles, who had attended the first meetings of the session. A resolution of sympathy with his family was passed.

The Chairman reported that 167 members had subscribed £121 towards the deficiency, and appealed for further help.

Mr. Henry Crowther, F.R.M.S., Curator of the Leeds Museum, gave a lecture on "The Shaping of the Coast of Britain," and illustrated his remarks with a large number of good lantern views, many coloured.

On the motion of the Chairman, seconded by Colonel H. L. Crook, D.L., V.D., a vote of thanks to Mr. Crowther was unanimously passed.

The 1,078th Meeting of the Society was held on Tuesday, November 12th, 1918, at 7.30 p.m. Mr. George Ginger presided.

The Chairman made some introductory remarks regarding the cessation of hostilities in the great war, and then read a letter from Mr. C. H. Bellamy, lately a prisoner in Tourcoing, thanking the Society for their congratulations.

The Chairman mentioned the loss by death of Messrs. W. J. Dean and J. J. Wilde, and on his suggestion a resolution of sympathy with their relatives was passed.

The election of two Associate Members, Mrs. E. C. Whitehouse and Miss C. Bolchover, was announced.

Mr. J. L. Paton, M.A., High Master of the Grammar School, gave a lecture on "A Holiday in Greece," illustrating his remarks chiefly with slides from his own photographs.

A hearty vote of thanks was passed to Mr. Paton.

The 1,079th Meeting of the Society was held on Friday, November 15th, 1918, at 3.30 p.m. Mr. J. Howard Hall presided.

Mr. E. W. Mellor, J.P., F.R.G.S., gave a lecture on "The Home of the Rajputs," and illustrated the account he gave of his visit with beautifully coloured lantern slides.

A hearty vote of thanks was accorded to the lecturer.

The 1,080th Meeting of the Society was held on Tuesday, November 19th, 1918, at 7.30 p.m. Mr. J. Stephenson Reid presided.

The Rt. Rev. Monsignor Kelly gave a lecture on "The Political and Social Conditions of Spain," and at the conclusion of his remarks described a number of lantern views of Southern Spain.

A vote of thanks to the lecturer was unanimously passed.

The 1,081st Meeting of the Society was held on Tuesday, November 26th, 1918, at 7.30 p.m. Mr. Ewin Pickstone presided.

The election of Miss B. Bedford, Lt.-Col. M. Gamble, R.A.M.C., M.D., and Mr. Percy Saunders as Ordinary Members was announced.

Mr. A. E. Collyer gave a lecture entitled: "More about Mexico and its People." His remarks were illustrated with a large number of lantern slides prepared especially for this lecture.

On the motion of the Chairman, seconded by Alderman J. R. Ragdale, J.P., a vote of thanks, in appreciation of the lecture and the illustrations, was passed.

The 1,082nd Meeting of the Society was held on Tuesday, December 3rd, 1918, at 7.30 p.m. Mr. R. A. Staniforth presided.

The Rev. J. H. Burkitt gave a lecture descriptive of "The Cathedrals and Abbeys 'twixt Mersey, Thames and Humber," and illustrated his remarks with a large number of fine lantern views. A hearty vote of thanks was tendered to the lecturer.

The 1,083rd Meeting of the Society was held on Tuesday, December 10th, 1918, at 7.30 p.m. Mr. T. A. Edwards, F.R.G.S., presided.

The death of Mr. F. M. Hurst was mentioned with regret by the Chairman, and a resolution of sympathy with Mrs. Hurst and family was passed.

Mr. Arnold Williams, A.C.A., gave a lecture, entitled: "Across Northern England on Foot," and illustrated his remarks with a very large number of lantern views.

A cordial vote of thanks to the lecturer was unanimously passed.

The 1,084th Meeting of the Society was held on Friday, December 13th, 1918, at 3.30 p.m. Mr. T. W. F. Parkinson, M.Sc., F.G.S., in the Chair.

Miss L. Edna Walter, M.B.E., H.M.I., B.Sc., gave a lecture on "Alpine Glaciers and their Work," and illustrated her remarks with lantern views from her own fine photographs.

A hearty vote of thanks was accorded to Miss Walter.

The 1,085th Meeting of the Society was held on Tuesday, December 17th, 1918, at 7.0 p.m. Colonel H. T. Crook, D.L., J.P., presided.

The Chairman mentioned the loss by death of Mrs. S. Smith and Mr. H. C. Pingstone, and a resolution of sympathy with their relatives was passed in silence.

The election of the following members was announced :—Ordinary : The Very Rev. the Dean of Manchester, Messrs. W. H. Barritt, A. Lawson Turner, and M. Wilks; Associate : Miss Kate Chorley.

Lt.-Col. G. S. F. Napier, late Military Attaché in Persia, gave a lecture on "The Road Travelled by our Troops from Baghdad to Baku," and illustrated his remarks with lantern views from photographs taken mostly by him while travelling with the Russian troops.

In moving a vote of thanks to the lecturer, Mr. H. Agar, Persian Consul, mentioned that it was proposed to form a Persian Society in Manchester, and invited adherents.

Lieut. W. L. Flinn seconded the resolution, which was passed.

The 1,066th Meeting of the Society was held on Friday, December 20th, 1918, at 6.0 p.m., when the annual lecture to the children of members and friends was delivered. Mr. E. W. Mellor, J.P., F.R.G.S., presided.

Alderman J. R. Ragdale, J.P., gave a lecture on "The Haunts and Legends of the Red Indians," and illustrated his instructive and amusing address with native curios, mostly obtained by him in the districts mentioned, and with a large number of lantern views, many of which were his own, others lent by Mr. R. A. Staniforth, and a few by the Atchison, Topeka and Santa Fe Railway Company.

The children, at the suggestion of the Chairman, showed their appreciation by hearty applause.

List of Maps, Books, Journals, etc.,

ACQUIRED BY THE SOCIETY
FROM JANUARY 1ST TO DECEMBER 31ST, 1918.

Maps.

EUROPE.

- Europe. 1/1,000,000. North J—33, Palermo; J—34, Athenai; K—31, Marseille; K—32 (Florence) Firenze; K—33, Roma; K—34, Sofiya; L—30, Bordeaux; L—31, Lyon; L—32, Milano; L—33, Triest; L—34, Buda Pest; L—35, Bucuresti; L—36, Odessa; M—29, Cork; M—30, London; M—31, Paris; M—32, Frankfurt; M—33, (Vienna) Wien; M—34, Krakau; M—35, Jitomir; M—36, Kiev; N—30, Edinburgh; N—31, Amsterdam; N—32 and part of N—31, Hamburg and part of Amsterdam; N—33, Berlin; N—34, (Warsaw) Varshava; N—35, Minsk; N—36, Smolensk; N—37, (Moscow) Moskva; O—29, Stornoway; O—30, Aberdeen; O—31, Stavanger; O—32 and part of O—31, Kristiania and part of Stavanger; O—33, Kalmar; O—34, Stockholm; O—35, Riga; O—36, Petrograd; O—37, Yaroslavl; P—29 and 30, Froshavn and Lerwick; P—33 and 34, Gäfle and Abo; P—35 and 36, Helsingfors and Petrozavodsk; P—37 and 38, Kargopol and Ustyug; Q—33 and 34 and part of Q—31, Bodö and Luleå and part of Namsos; Q—35 and 36, Uleåborg and Kem; Q—37 and 38, Arkhangelsk and Mezen; R—33 and 34, Lofoten and Tromsö; R—35 and 36, Nordkap and Romanov; R—37 and 38, Rinda and Kanin. Geographical Section, General Staff, No. 2,758. London: War Office. 1915—17. (Price, 1/- each sheet.) *The Director of Military Intelligence.
- Skeleton Map of Western Europe. Scale, 1/500,000. Sheets 2, 3, 4, 5, 6, 7, 8, 9. Geographical Section. General Staff, No. 2,736. London: War Office, 1914. (Price, 1/- each sheet.) *The Director of Military Intelligence.
- Western Theatre of War. Scale, 1/1,000,000. Geographical Section. General Staff, No. 3,024. London: War Office, 1915. (Price, 1/- net.) *The Director of Military Intelligence.
- North West Europe. Sheets 1, 2, 4, 5. Scale, 1/250,000. Geographical Section, General Staff, No. 2,733. London: War Office, 1914-18. (Price, 2/- each sheet.) *The Director of Military Intelligence.
- Skeleton Map of Central Europe. Scale, 1/750,000. Sheets 1, 1a, 2, 3, 4, 5, 6. Geographical Section, General Staff. No. 2,734. London: War Office, 1914-15. Price, 1/- each sheet.) *The Director of Military Intelligence.
- Belgium and France. Scale, 1/100,000. Sheets 1, Ostend; 1a, Dunkerque; 2, Ghent; 3, Antwerp; 4, Maeseyck; 5, Tournai; 5a, Hazebrouck; 6,

Brussels; 7, Liege; 8, Namur; 9, Marche; 10, Arlon; 11, Lens; 12, Valenciennes; 13, Calais; 14, Abbeville; 16, Dieppe; 17, Amiens; 18, St. Quentin; 19, Mezieres; 21, Beauvais; 22, Soissons. Geographical Section, General Staff, No. 2,364. London; War Office, 1911-18. (Price, 2/- each sheet.) *Director of Military Intelligence.

Map of the Somme Area. Scale, 1/40,000. Geographical Section, General Staff No. 3,347. London: War Office, 1916. (Price, 1/- net.) *The Director of Military Intelligence.

Germany. Scale, 1/250,000. Sheets—55, Munster; 56, Hannover; 59, Cöln; 60, Cassel; 63, Koblenz; 64, Frankfurt; 67, Stuttgart; 67a, Strasbourg. Geographical Section, General Staff, No. 2,740. London: War Office, 1915-18. (Price, 2/- each sheet.) *The Director of Military Intelligence.

Eastern Frontier of Germany. Scale, 14 miles = one inch. Geographical Section, General Staff, No. 3007. London: War Office, 1915. (Price, 1/- net.) *The Director of Military Intelligence.

The Balkans. Scale, 1/250,000. Sheets—Ipek; Prishtina; Sofia; Scutari; Uskub; Elbasan; Monastir; Valona; Kozana. Geographical Section, General Staff, No. 2,097. London: War Office, 1915. (Price, 2/6 each sheet.) *The Director of Military Intelligence.

Map of the Anzac Position, Gallipoli, to illustrate Sir Ian Hamilton's Despatch of December 11th, 1915. Scale, 1/20,000. Two copies. Geographical Section, General Staff, No. 2,805. London: War Office, 1916. (Price, 1/- net.) *The Director of Military Intelligence.

Turkey. 1/250,000. Sheet, Lemnos. Geographical Section, General Staff, No. 2,097. London: War Office, 1915. *The Director of Military Intelligence.

ASIA.

Asia. 1/1,000,000. North H—38, Cairo; H—37, El Djauf; H—38, Basra; I—36, Beirut; I—37, Esh Sham (Damascus); I—38, Baghdad; I—39, Tehran; J—35, Izmir (Smyrna); J—36, Koma; J—37, Erzerum; J—38, Tabriz; J—39, Resht; K 35, Istambul (Constantinople); K—36, Sinob; K—37, Batum; K—38, Tiflis; K—39, Baku. Geographical Section, General Staff, No. 2,555. London: War Office, 1916-1918. (Price, 1/- and 2/- each sheet.) *The Director of Military Intelligence.

Syria. Scale, 1/250,000. Two sheets. (1) Jerusalem; (2) Jaffa—Damascus. Geographical Section, General Staff, No. 2,321. London: War Office, 1916-17. (Price, 2/6 each sheet.) *The Director of Military Intelligence.

Asia Minor. Scale, 1/250,000. Ismid. Geographical Section, General Staff, No. 2,097. London: War Office, 1909. (Price, 2/6 net.) *The Director of Military Intelligence.

Postal Map of China, 1917. Scale, 1/2,400,000, or 38 miles = 1 inch. Enclosure to Report on the Working of the Chinese Post Office, 1917. Shanghai: The Directorate General of Posts, 1918. Price, 50 cents.) *The Director of General Posts.

AFRICA.

Africa. 1/1,000,000. North B—36 and part of North A—36. Mongalla. Geographical Section, General Staff, No. 1,539. London: War Office, 1914. (Price, 2/- net.) *The Director of Military Intelligence.

- Africa. 1/1,000,000. North A—37 and part of A—38, Marsabit; South A—36, Lake Victoria; A—37, A—38, and part of B—37, Mombasa--Nairobi; B—36, and part of B—35, Tabora; B—37, Dar Es Salaam; C—36, Lake Nyasa; C—37, Lindi. Geographical Section, General Staff, No. 2,465. (Price, 2/- each sheet.) London: War Office, 1915-18. *The Director of Military Intelligence.
- Africa. 1/125,000. Orange Free State. South H—35, C—1, Bulfontein; H—35, I—11, Thaba'nchu; H—35, I—IV, Dewetsdorp. Geographical Section, General Staff, No. 2,230. London: War Office, 1913-14. *The Director of Military Intelligence.
- German East Africa. General Map. Scale, 1/2,000,000. Geographical Section, General Staff, No. 2,814. London: War Office, 1916. (Price, 2/- net.) *The Director of Military Intelligence.
- Sketch Map of Rhodesia. Scale, 1/2,500,000. Geographical Section, General Staff, No. 2,691. London: War Office, 1914. (Price, 1/6 net.) *The Director of Military Intelligence.
- Africa. 1/250,000. East Africa Protectorate. North A—36 W, Mumia's; South A—36 A, Karungu; A—36 F, Kericho. Geographical Section, General Staff, No. 1,764. London: War Office, 1916. (Price, 1/6 each sheet.) *The Director of Military Intelligence.
- Africa. 1/250,000. Uganda. South A—36 A, Mbarara. Geographical Section, General Staff, No. 2,571. London: War Office, 1917. (Price, 2/- net.) *The Director of Military Intelligence.
- Mombasa—Victoria (Uganda) Railway and Busoga Railway. Scale, 1/1,500,000. Geographical Section, General Staff, No. 2,687. London: War Office, 1913. (Price, 1/6 net.) *The Director of Military Intelligence.
- The Anglo-Egyptian Sudan. Scale, 1/3,000,000. Geographical Section, General Staff, No. 2,692. London: War Office, 1914. (Price, 2/6 net.) *The Director of Military Intelligence.

AMERICA.

The following Maps of Peru were presented by the Publishers, Sociedad Geografica de Lima, Mapoteca:—

- El Peru, en 1913. Trazado por la Sociedad Geografica de Lima y mandado publicar y distribuir gratuitamente en el xxv. aniversario de su Institucion por su socio Fundador Excmo Sr. Guillermo E. Billingham, Presidente de la Republica. Escala, 1/3,000,000. Dibrijado por Camils Vallejos. Lima: 1913.
- Mapa de la region Central del Peru, en 1906. Escala, 1/1,000,000. Plano del Rio Putumayo. Escala, 1/500,000, 1908. Plano del Rio Napo. Escala, 1/500,000, 1908. Mapa del Departments de Loreto. Escala, 1/1,000,000, 1906. (Two sheets). Plano del Rio Bajo Marañon. Plano del Rio Serjali, 1902.
- Peru. Plano del Rio Ucayali. Escala, 1/500,000, 1908. Vias de Comunicacion entre Paíta, Eten y la parte navegable de Rio Marañon. Escala, de 2 milímetros por 1 kilómetro. Plano del Rio Pachitea y Pichis. Escala, 1/500,000, 1908. Plano del Rio Tigre. Escala, 1/500,000, 1908. Mapa del Alto Yurua y Alto Purus. Escala, 1/1,000,000, 1907. Lago Titicaca.

Escala, 1/500,000, 1893. Mapa de la Provincia de Pacasmayo, 1902. Mapa de los Rios Tigre—Pastaza y Morona. Escala, 1/1,000,000, 1907. Plano del Cuzco. Escala, 1/5,000, 1900. Plano del Rio Huallaga. Escala, 1,500,000, 1908. Plano del Rio Tambropata, 1902. Mapa Historico Geográfico de los valles de Paucartambro. Escala, 1/200,000, 1904. Plano del Rio Pastaza. Escala, 1/500,000, 1908. Plano del Rio Manu. Escala, 1/60,000, 1902. Corte Geologico de Casma á Chacas. Region Oriental del Peru. Escala, 1 milimetro por 1 kilometro, 1906. Plano del Rio "Ucayali." Escala, 1/500,000, 1904. Corte Geologico de las irmediaciones de Morococha. Escala, 48 milimetros por legua, 1861. Croquis de los Rios Napo y Putumayo. Escala, 1/1,000,000, 1905. Croquis General de los Rios Estudiados por la Comision Exploradora del Istmo Fitz-Garroid, 1902. Mapa de la Navegacion del Alto Marañon. Escala, 1/250,000, 1913. Plano del Rio Amazonas Peruano. Escala, 1/500,000, 1908. Croquis de los Rios Alto Ucayli y Bajo Urubamba. Escala, 1/500,000, 1906.

ATLASES, PHOTOGRAPHS, &c.

The Harmsworth Atlas and Gazetteer. 500 Maps and Diagrams in Colour, with Commercial Statistics and Gazetteer Index of 105,000 names. London :

Barograms recorded by the Right Rev. the Bishop of Salford's Barograph, at St. Bede's Lodge, Alexandra Park, Manchester, S.W. Vol. III, 11th June, 1916, to 21st September, 1918. *Rt. Rev. the Bishop of Salford.

Index to the Map of the Western Theatre of War. Washington : National Geographic Society, 1918.

Books.

GENERAL.

Geographical Discovery.—How the World Became Known, by Joseph Jacobs. 26 Maps. Revised and Enlarged Edition. London : [1912]. *Miss K. Qualtrough, F.R.G.S.

The Student's Manual of Ancient Geography, by Rev. W. L. Bevan, M.A. Edited by Wm. Smith, LL.D. Maps, Plans and Illustrations. London : 1891. *Miss K. Qualtrough, F.R.G.S.

Human Origins, by S. Laing. Illustrated. London : 1892. *Miss K. Qualtrough, F.R.G.S.

Les Appétits Allemands. 1st Série. Les Ambitions de l'Allemagne en Europe par MM. H. Lichtenberger, G. Blondel, Joseph Barthélemy, G. Bienaimé, F. Engerand, E. Haumant. Préface de M. Paul Deschanel. Carte. Paris : Felix Alcan, 1918. (Price, 3 fr. 50.) *Société de Géographie de Paris.

Les Appétits Allemands. 2nd Série. Les Rêves d'hégémonie mondiale par MM. R. Henry, E. A. Martel, Baron Hulot, H. Froidevaux, J. Dybowski. Paris : Felix Alcan, 1918. (Price, 3 fr. 50.) *Société de Géographie de Paris.

The Geographical Teacher, the organ of the Geographical Association, Nos. 50, 51, 1918. *Mr. H. Sowerbutts, A.R.C.Sc.

Almanack for the year 1918, by Joseph Whitaker, F.S.A. London : 1918.
The Fortnightly Review, 1918. January—December. *Miss K. Qualtrough,
F.R.G.S.

Incorporated Accountants' Alphabetical List of Members, Report of the
Council, &c., 1918-19. London. *The Council.

Colonies et Marine, Année 1, Nos. 3 March, 4 April, 5 May, 6 June-July,
7 September-October, 8 November-December. Paris : 1918. *The
Publishers.

BRITISH ISLES.

In Praise of London. Illustrated. London : Country Life, Christmas
Number, 1917. *Miss K. Qualtrough, F.R.G.S.

A Description of the Country from thirty to forty miles round Manchester.
The materials arranged, and the work composed by J. Aikin, M.D.
Embellished with 73 Plates (Maps, Plans, and Illustrations). London :
John Stockdale, June 4, 1795. *Mr. George Thomas, J.P.

The Official Handbook of Manchester and Salford and Surrounding District,
with information on Local Institutions and Societies. Manchester : Man-
chester Corporation, 1918.

The Portmote or Court Leet Records of the Borough or Town and Royal
Manor of Salford from the year 1597 to the year 1669 inclusive. Tran-
scribed and Edited by J. G. de T. Mandley. Vol. I (1597-1632). Man-
chester : Chetham Society, 1902. *Mr. George Thomas, J.P.

A History of the Parish of Flixton (Lancashire), comprising the townships
of Flixton and Urmston, with a short sketch of the adjoining hamlet of
Davyhulme, by David Herbert Langton. Map and Illustrations. Man-
chester : 1898. *Mr. George Thomas, J.P.

Bolton Bibliography, and Jottings of Book-lore, with notes on local Authors
and Printers, by Jas. C. Scholes. Manchester : 1886. *Mr. George
Thomas, J.P.

EUROPE.

The Making of the Future—Human Geography in Western Europe, by Professor
H. J. Fleure. Maps. London : Williams & Norgate, 1918. Price 5/- net.
*The Publishers.

The Land of the Midnight Sun : Summer and Winter Journeys through
Sweden, Norway, Lapland and Northern Finland, by Paul B. du Chaillu.
Map and Illustrations. London : 1899. *Mr. George Thomas, J.P.

Svenska Turistföreningens Arsskrift. Illustrated. Stockholm : 1918.
*Svenska Turistföreningen (The Swedish Touring Club).

Belgium Illustrated, by S. Leguet. Maps, Plans and Illustrations. (Ghent
Exhibition Number.) Croydon, Surrey : 1913. *Mr. George Thomas, J.P.

Alsace-Lorraine. 10 Pamphlets. *The Ligue Patriotique des Alsaciens-
Lorrains.

Provence and Languedoc, by Cecil Headlam, M.A. Map and Illustrations.
London : 1912. *Mr. George Thomas, J.P.

Indicateur Officiel Guide General de la Corse. Map. Plans. 10me annee.
Nos. 28, 30, 1918. Paris : Cavel, 1918. *The Publisher.

Old Etruria and Modern Tuscany, by Mary Lovett Cameron. 32 Illustra-
tions. London : 1909. *Mr. George Thomas, J.P.

Turkey and the Turks : Being the Present State of the Ottoman Empire, by John Reid. Map, Plan and Illustrations. London : 1840. *Mr. George Thomas, J.P.

The Sea-Kings of Crete, by Rev. James Baikie, F.R.A.S. Illustrations. London : 1910. *Miss K. Qualtrough, F.R.G.S.

ASIA.

Dawn in Palestine, by William Canton. Preface by Lord Bryce. Map and Illustrations. London : 1918.

A History of Sumer and Akkad. An account of the early races of Babylonia from pre-historic times to the foundation of the Babylonian monarchy, by Leonard W. King, M.A., F.S.A. Map, Plans and Illustrations. London : 1910. *Miss K. Qualtrough, F.R.G.S.

Troy. A Study in Homeric Geography, by Walter Leaf. Maps, Plans and Illustrations. London : 1912. *Miss K. Qualtrough, F.R.G.S.

Nineveh and its Palaces—the Discoveries of Botta and Layard, applied to the elucidation of the Holy Writ, by Joseph Bonomi, F.R.S.L. Maps and Illustrations. Second Edition. London : 1853. *Miss K. Qualtrough, F.R.G.S.

The Penetration of Arabia. A Record of the Development of Western Knowledge concerning the Arabian Peninsula, by David George Hogarth, M.A., F.R.G.S., F.S.A. Illustrations. Maps by J. G. Bartholomew. London : 1904. *Miss Kate Qualtrough, F.R.G.S.

The People and Politics of the Far East in 1894. Travels and Studies in the British, French, Spanish, and Portuguese Colonies, Siberia, China, Japan, Korea, Siam and Malaya, by Sir Henry Norman, M.P. Seventh Impression. Maps and Illustrations. London : 1907. *Mr. George Thomas, J.P.

Siam, by Pierre Loti. Translated from the French by W. P. Baines. Illustrated. London.

Punjab District Gazetteers. Vol. X A, Kangra District. Parts II, Kulu and Saraj; III, Lahul; IV, Spiti. With Maps and Photographs. 1917. Vol. XXIV A, Shahpur District. With Maps. 1917. Lahore : 1918. *H.M. Secretary of State for India in Council.

Punjab District Gazetteers. Vol. XIV B, Jullundur; XXX B, Lahore. Lahore : 1917. *H.M. Secretary of State for India in Council.

Punjab States Gazetteers. Vol. XIV B, Kapurthala State. Lahore : 1917. *H.M. Secretary of State for India in Council.

Central Provinces District Gazetteers. B. Vols. 1891-1914. Bhandara, Chhindwara, Nagpur. *H.M. Secretary of State for India.

Madras District Gazetteers—Tinnevely, Vol. I. Madras : 1917. *H.M. Secretary of State for India in Council.

District Gazetteers of the United Provinces of Agra and Oudh. Supplementary Notes and Statistics to Vols. XI., Etawah XX, Fatehpur XXXIV, Naini Tal XLVI, Sultanpur. Allahabad : 1917. *H.M. Secretary of State for India in Council.

Bengal District Gazetteers. Vol. XXXIV, Mymensingh. A Volume. Calcutta : 1917. *H.M. Secretary of State for India in Council.

Bihar and Orissa District Gazetteers. Hazaribagh. Map. Patna : 1917. *H.M. Secretary of State for India in Council.

Burma Gazetteers. Akyab District, Vol. A. Rangoon : 1917. *H.M. Secretary of State for India in Council.

AFRICA.

- In the Desert—The Hinterland of Algiers, by L. March Phillipps. Sketch Map, Plan, Illustrations. London : 1909. *Mr. George Thomas, J.P.
- With the Turks in Tripoli. Being some experiences in the Turco-Italian War of 1911, by Ernest N. Bennett. Maps. London : 1912. *Mr. George Thomas, J.P.
- Sierra Leone Messenger. Nos. 101, March ; 102, September, 1918. *Rev. F. C. Smith, M.A., F.R.G.S.
- Papers on the Great Pyramid, including a Critical Examination of Sir Henry James' "Notes on the Great Pyramid of Egypt," by St. John Vincent Day, C.E., F.R.S.E. Edinburgh : 1870. *Mr. George Thomas, J.P.

AMERICA.

- An Appreciation of America. Illustrated. London : Country Life. Summer Number, 1917. *Miss K. Qualtrough, F.R.G.S.
- A Yorkshireman's Trip to the United States and Canada, by William Smith, F.S.A.S. Illustrations. London : 1892. *Mr. George Thomas, J.P.
- The Canada Year Book. 1916-17. Published by authority of the Minister of Trade and Commerce. Map. Diagrams. Illustrations. Ottawa : 1917. *The High Commissioner for Canada.
- In Northern Labrador, by William B. Cabot. Maps and Illustrations. London : 1912.
- United States Geological Survey. Bulletin Nos. 13 and 201. *Mrs. G. J. Hinde, Croydon.
- Memorial Volume of the Transcontinental Excursion of 1912 of the American Geographical Society. Maps. Diagrams. Portraits and Illustrations. New York : American Geographical Society, 1915. *The Society.
- The Mexican Constitution of 1917 compared with the Constitution of 1857. Translated and arranged by H. N. Branch, LL.B. With a foreword by L. S. Rowe, Ph.D., LL.D. Philadelphia : The Academy of Political and Social Science. *Mr. A. E. Collyer.
- On the Surveys of proposed lines for a Ship Canal between the Atlantic and the Pacific. The Panama Railroad. On the Isthmus of Darien and the Ship Canal, by Edward Cullen. Maps and Diagram. London : Society of Engineers, Transactions. 1868. *Colonel H. T. Crook, D.L., V.D.
- South America and the War. Being the substance of a course of lectures delivered in the University of London, King's College, under the Tooke Trust in the Lent term, 1918, by F. A. Kirkpatrick, M.A. Map. Cambridge : University Press. 1918. (Price, 4/6 net.) *The Publishers.
- Account of a Journey down the Magdalena River, through the Magdalena Province and the Peninsula of Goajira (Colombia), by M. T. Dawe, F.L.S. Map and Illustrations. Bogota, Colombia : The Ministry of Agriculture and Commerce. 1917. *The Director, Royal Botanic Gardens, Kew.
- Los Chipayas de Carangas. Prof. Ing. Arthur Posnansky, F.R.A.I. Illustrated. Segunda Edición. La Paz, Bolivia : Instituto Tihuanacu de Antropología, Etnografía y Prehistoria. 1918. *The Institute.

List of Corresponding Societies, etc. (Exchanges).

BRITISH.

- Belfast. Natural History and Philosophical Society. Report and Proceedings for the Session 1916-1917.
- Croydon. Natural History and Scientific Society. Proceedings and Transactions. Vol. VIII., Part IV., 1917.
- Edinburgh. The Royal Scottish Geographical Society. The Scottish Geographical Magazine, 1918, Vol. XXXIV., Nos. 1-12 and Index.
- Glasgow. Geological Society. Transactions. Vol. XVI., Part II., 1916-17.
- Glasgow. Royal Philosophical Society. Proceedings, 1916-1917. Vol. XLVIII.
- Liverpool. Geographical Society. Transactions and Twenty-sixth Annual Report for the year 1917.
- London. The Anti-Slavery Reporter and Aborigines' Friend. 1918, Series V, Vol. VII., No. 4; VIII., 1, 2, 3.
- London. British Association for the Advancement of Science. Report of the Eighty-seventh Meeting, held in London in 1917. Report of the Corresponding Societies' Committee and of the Conference of Delegates held in London, 1917.
- London. Colliery Guardian, 1918, Nos. 2975-3026.
- London. The Colonial Journal. Vol. XI., 3, 4; XII., 1, 2.
- London. The Royal Colonial Institute Journal. "United Empire." Vol. IX., Nos. 1-12.
- London. East India Association. Journal, 1918 Vol. IX., Nos. 1-4.
- London. Royal Geographical Society. The Geographical Journal, 1918. Jan. to Dec. Supplement Nos. 1-2.
- London. Imperial Institute. Bulletin. Vol. XV., No. 4; XVI., 1-4.
- London. India Office. (See List of Books).
- London. Royal Botanic Gardens, Kew. Bulletin, 1918. Nos. 1-10 and Appendices I-II.
- London. The Near East, 1917, Nos. 348-399.
- London. War Office. Geographical Section, General Staff. (See List of Maps.)
- London. War Office Library. Accessions, 1918, January to December. Catalogue of the War Office Library. Part III. (Sixth Annual Supplement, 1917.)
- Manchester. The British Cotton Growing Association. Publications. No. 66, 13th Annual Report, 1917.
- Manchester. Literary and Philosophical Society. Memoirs and Proceedings. Vol. 61, Part II, III; 62, I.
- Manchester. Textile Recorder, 1918, January to December.

Newcastle-on-Tyne. North of England Institute of Mining and Mechanical Engineers. Transactions. Vols. LXVII., Parts 1—5. LXVIII., 1—4. Annual Report. 1916-17.

Oxford. Clarendon Press. (See List of Books.)

Rochdale. Literary and Scientific Society. 39th Annual Report, 1917.

Salford. Museums, Libraries and Parks Committee. 68th Report. 1916-17.

York. Yorkshire Philosophical Society. Annual Report for 1917.

MISSIONARY.

London. Baptist Missionary Society. *The Herald*. 1918. January to December.

London. The British and Foreign Bible Society. "The Bible in the World," 1918, January to December. Manchester and Salford Auxiliary, Annual Report, 1917.

London. Church Missionary Review, 1918, Quarterly.

London. Colonial and Continental Church Society. *Greater Britain Messenger*, 1918, January to December.

London. Society for Propagation of the Gospel in Foreign Parts. Report of the year 1917.

London. Universities' Mission to Central Africa. "Central Africa." 1918, January to December.

London. The United Methodist Church. "Missionary Echo." 1918. Jan. to December.

COLONIAL.

Adelaide. Royal Geographical Society of Australasia; South Australian Branch. Proceedings for the Session 1916-17. Vol. XVIII.

Brisbane. Department of Mines. Queensland Geological Survey. Publications, Nos. 255, 257 to 261.

Bulawayo. Rhodesia Scientific Association. Proceedings, 1915-1917, XV., Parts I, II; 1917-1918, XVI., I, II.

Cape Town. Royal Society of South Africa. Vol. VI., Part 2. Vol. VII., Parts 1, 2.

Georgetown. The Royal Agricultural and Commercial Society of British Guiana. *The Journal*. "Timehri." Vol. V., 1918. Historical Illustrated Volume.

Halifax. Nova Scotian Institute of Science. Proceedings and Transactions. Vol. XIV. Part 3. 1916-17.

Johannesburg. South African Geographical Journal. 1917. Vol. I., No. 1.

Perth. Western Australia Geological Survey (per favour of the Agent-General). Bulletins, Nos. 67, 68, 68 maps, 69, 69 maps, 71, 71 maps, 72 to 76.

Port Moresby. Papua. Annual Report for the year 1916-1917.

Quebec. Société de Géographie. Bulletin. Vol. XII., Nos. 1, 4, 5, 1918.

Toronto. Royal Canadian Institute. Transactions. No. 26. Vol. XI. Part 2. November, 1917.

Victoria, B.C. Minister of Mines. Province of British Columbia. Annual Report, 1917.

FOREIGN.

- Wellington, New Zealand. Department of Lands and Survey. Report on the Survey Operations, 1917-18; Report on Scenery Preservation, 1917-18.
- Alger. Société de Géographie d'Alger et de L'Afrique du Nord. Bulletin. Pars II., 1917. I. II., 1918.
- Ann Arbor. The Michigan Academy of Science. Annual Reports, 1915, 1916, 1917. Museum of Zoology. Miscellaneous Publications, Nos. 3, 4, 1918. Occasional Papers, Nos. 42-56. 1917-18.
- Baltimore. John Hopkins University. Studies in Historical and Political Science. Series XXXVI., Nos. 1-3. Circulars, 1917, Nos. 1-10. 1918, 1-4.
- Barcelona. Sociedad de Geografia Comercial. Publicaciones. Nos. 9-13. 1914-1918.
- Berkeley. University of California. Publications. Geography. Vol. I. No. 10. Index. American Archaeology and Ethnology. Vol. XI., Index. XII. Nos. 2-11, Index. XIII., 1.
- Bordeaux. Société de Géographie Commerciale. Revue, 1917, Nos. 7-12.
- Buenos Aires. Monthly Bulletin of Municipal Statistics. 1917, Nos. 11-12; 1918, 1-4, 6-8.
- Buenos Aires. Ministerio de Agricultura de la Nacion. Boletin. Tomo XXII., No. 2, 1917; XXIII., 1, 1918.
- Cambridge. Peabody Museum of American Archaeology and Ethnology. Harvard University. 51st Report, 1916-1917.
- Chicago. The John Crerar Library. I. to XI., XIII to XXII. Annual Reports. 1895-1905, 1907-1917. Catalogue (XI parts).
- Chicago. The Chicago Academy of Sciences Bulletin. No. III. Parts I, II.
- Christiania. Norges Geografisk Opmaalng. (See List of Maps.)
- Copenhagen. Geografisk Tidsskrift udgivet af Bestyrelsen for det Kongelige Danske Geografiske Selskab. Bind XXIV., Hefte VI., VII.
- Firenze (Florence). Rivista Geografica Italiana o Bollettino della Società di Studi Geografici e Coloniali. Annata XXV., Fasc. 1-10.
- Geneva. "Le Globe." Organe de la Société de Géographie. Mémoires. Tome LVI., 1917.
- Geneva. Société des Anciens Elèves l'Ecole Supérieure de Commerce. Bulletin. Nos. 117-118.
- Havre. Société de Géographie Commerciale. Bulletin XXXIV., 2-4, 1917.
- La Plata. Direction General de Estadística de la Provincia de Buenos Aires. Boletin Mensual. Ano. XVIII., No. 198.
- Lima. Sociedad Geográfica. Boletin. Tomo XXXIII. Trim. I.-IV.
- Lima. Cuerpo de Ingenieros de Minas del Perue. Boletin. Nos. 84-92.
- Lisbon. Sociedade de Geographia de Lisboa. Boletin. 1917, Nos. 7-12.
- Madrid. Real Sociedad Geografica. Boletin. Tomo LX., Trims. 1-4. Revista. Tomo XV., 1-12.
- Madrid. Ayuntamiento de Madrid. Boletin, Nos. 1097-1148.
- Marseille. Société de Géographie et d'Etudes Coloniales. Bulletin Tome XI., Nos. 1-4, 1916. XLI., 1-4, 1917.
- Mexico. Sociedad Mexicana de Geografia y Estadística. Boletin Tomo VII., 7-9, 1918.

- Mexico. Sociedad Científica "Antonio Alzate," *Memorias y Revista*. Tomo XXXIV., 11-12; XXXVII., 1; XXXVIII., 1-2.
- Milan. L'Esplorazione Commerciale. Anno XXXIII. Fascs. 1-12.
- Montevideo. Anuario Estadístico de la República Oriental del Uruguay. Libro XXV., 1915. Publication XL., 1918.
- Montpellier. Société Languedocienne de Géographie. Bulletin. Tome XL., 3.
- Naples. Società Africana d'Italia. "L'Africa Italiana." 1918. Fascs. 1-4; 1917, 1-5.
- Neuchâtel. Société Neuchâteloise de Géographie. Bulletin. Tome XXVII.
- New Haven. Connecticut Academy of Arts and Sciences. Transactions. Vol. XXII., pages 249-467. June, 1918.
- New York. American Geographical Society. The Geographical Review. 1918. January to November. Index to the Bulletin, 1852-1915.
- New York. American Museum of Natural History. Bulletin. Vol. XXXVI., 1917. A Bibliography of Fishes. Vol. II.
- New York. Public Library. Bulletin. 1918. January-December.
- Novara. Instituto Geografico de Agostini. (See List of Maps.)
- Oran. Société de Géographie et d'Archéologie. Bulletin. Tome XXXVIII, Nos. 150, 151.
- Paris. Société de Géographie. La Géographie. Tome XXXI., No. 5.
- Paris. Société de Géographie Commerciale. Bulletin. 1917, November-December; 1918, January-June.
- Paris. Comité de L'Afrique Française et du Comité du Maroc. Bulletin. 1918, Nos. 1-12. Renseignements Coloniaux. 1918, Nos. 1-12.
- Philadelphia. American Philosophical Society. Proceedings. Vol. LVI., 3-7; LVII., 1-6. List of Members, 1917.
- Philadelphia. The Commercial Museum. "Commercial America." 1918. January February, October-December.
- Philadelphia. University of Philadelphia. The Museum Journal. Vol. VII., No. 4; VIII., 1-4; IX., 1-2. Report, 1917.
- Rocheftort. Société de Géographie. Bulletin. Tome XXXVII., No. 1.
- Roma. Reale Società Geografica. Bollettino. 1918. Nos. 1-2.
- Rome. International Institute of Agriculture. Monthly Bulletin of Agricultural Intelligence and Plant Diseases. 1917, 12; 1918, 1-12.
- St. Louis. Washington University Studies. Vol. IV., Part I, No. 2; V., Nos. 1, 2; VI., No. 1.
- Shanghai. Chinese Maritime Customs. Gazette. Statistical Series. Nos. 3-5. Returns of Trade and Trade Reports. 1917, Part I; Part II, Vols. 1-5; Part III., Vols. 1-2.
- Shanghai. Ministry of Communications. Directorate General of Posts. II. Public Series: No. 2. Report on the Working of the Chinese Post Office for 1917.
- Stockholm. Svenska Sällskapet för Antropologi och Geografi. "Ymer," 1917. Häft, 3-4; 1918, 1-4.
- Toulouse. Société de Géographie. Bulletin. 1917. No. 2.
- Upsala. The Geological Institution of the University of Upsala. Bulletin Vol. XIII., Part 2; XIV.; XV.

- Urbana. Illinois State Geological Survey. Bulletins, Nos. 23, 30.
- Washington, D.C. National Geographic Society. National Geographic Magazine. 1917, Vol. XXXIII. Nos. 1-6; XXXIV., 1-2.
- Washington, D.C. Department of Commerce, United States Coast and Geodetic Survey. Annual Reports, 1916-17; 1917-18. Serials, Nos. 75, 84, 86. "Terrestrial Magnetism." Special Publication, Nos. 42, 44, 51.
- Washington, D.C. United States Department of the Interior. Report of the Director of the National Park Service for the year ended June 30, 1917.
- Washington, D.C. U.S. Geological Survey. Bulletin, Nos. 645, 649.
- Washington, D.C. U.S. National Museum. Reports for the years ending June 30, 1916, June 30, 1917. Reprints from the Smithsonian Report for 1916. Publications 2,457, 2,471.
- Washington, D.C. Library of Congress. Annual Report, 1917.
- Washington, D.C. Pan American Union. Bulletin. 1918. January to Dec.
- Washington, D.C. Carnegie Institution. Department of Terrestrial Magnetism. Annual Report for 1917.

List of Members.

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I. OBJECT AND WORK.

The object of the Manchester Geographical Society is to promote the study of all branches of Geographical Science, especially in its relations to commerce and civilisation.

The work of the Society shall be :—

1. To further in every way the pursuit of the science; as, by the study of official and scientific documents, by communications with learned, industrial and commercial societies, by correspondence with consuls, men of science, explorers, missionaries, and travellers, and by the encouragement of the teaching of geography in schools and colleges.

2. To hold meetings at which papers shall be read, or lectures delivered by members or others.

3. To examine the possibility of opening new markets to commerce and to collect information as to the number, character, needs, natural products and resources of such populations as have not yet been brought into relation with British commerce and industry.

4. To promote and encourage, in such way as may be found expedient, either alone or in conjunction with other Societies, the exploration of the less known regions of the earth.

5. To inquire into all questions relating to British and Foreign colonisation and emigration.

6. To publish a Journal of the proceedings of the Society, with a summary of geographical information.

7. To form a collection of maps, charts, geographical works of reference, and specimens of raw materials and commercial products.

8. The Society shall not enter into any financial transactions beyond those necessarily attached to its declared object, and shall not make any dividend, gift, division, or bonus in money unto or between any of its members.

II. ORGANISATION.

9. The Society shall consist of ordinary, associate, corresponding, and honorary members.

10. A Council shall be chosen annually from the ordinary members to conduct the affairs of the Society. It shall consist of a President, four or more Vice-Presidents, a Treasurer, two or more Honorary Secretaries (including a Secretary for Foreign Correspondence), and twenty-one Councillors.

11. There shall be three Trustees elected by the Society, who shall hold office until death, disability, insolvency, or resignation. They shall be members of the Council by virtue of their office.

12. Any vacancy occurring in the Council during the current year may be filled up by the Council,

III. ELECTION OF MEMBERS.

13. Every candidate for admission into the Society as an ordinary or an associate member must be proposed by a member. The proposal shall be read out at the next Ordinary Meeting of the members, and any objection shall be forwarded in writing to the Secretary within seven days.

14. The election of members is entrusted to the Council. The names of those elected shall be announced from the chair at the next Ordinary Meeting after the election.

15. The Secretary shall within three days forward to every newly-elected member notice of his election, a copy of the Rules of the Society, and a card announcing the days on which the Ordinary Meetings will be held during the session. But the election of an ordinary or associate member shall not be complete, nor shall he be permitted to enjoy the privileges of a member, until he shall have paid his first year's subscription. Unless such payment be made within three calendar months from the date of election the election shall be void.

16. The Council shall have power to elect honorary and corresponding members.

17. Women shall be eligible as members and officers of the Society.

IV. PAYMENTS.

18. An ordinary member shall pay an annual subscription of £1. 1s., or he may compound by one payment of £10. 10s. An associate member shall pay an annual subscription of 10s. 6d. The Society's year shall begin on the first day of January.

19. Members shall not be entitled to vote or to enjoy any other privilege of the Society so long as their payment shall continue in arrear, but associate members shall not vote nor shall they take any part in the government of the Society.

20. The first annual payment of a member elected in November or December shall cover his subscription to the 31st December in the year following.

21. On the first day of January in each year there shall be put up in the rooms of the Society a complete list of the members with the amount of their subscription due, and as the amounts are paid the fact shall be marked on the list.

22. Notice shall be sent to every member whose subscription shall not have been paid by the first of February, and if the arrears are not discharged by the first of July the Council may remove the member from the list of members. Any member, whose subscription is in arrear for two years shall not be entitled to receive the Journal of the Society.

V. MEETINGS.

23. The meetings of the Society shall be of three kinds—Ordinary, Annual, and Special.

24. In all meetings a majority of those present shall decide all questions, the President or Chairman having a casting vote in addition to his own.

Ordinary Meetings

25. The Ordinary Meetings of the Society shall be held once a month, from the month of October to the month of May, or oftener, if judged expedient by the Council.

26. All members whose subscriptions are not in arrear shall have a right to be present. All ordinary members shall have the privilege of introducing one visitor.

27. The order of the proceedings shall be as follows:—

- (a) The minutes of the last meeting to be read and if correctly recorded they shall be signed by the Chairman.
- (b) Presents, whether of money, books, maps, charts, instruments or specimens made to the Society to be announced.
- (c) The election of new members to be declared and the names of candidates to be read.
- (d) Papers and communications to be read and discussed.

28. At these meetings nothing relating to the rules or management shall be brought forward, but the minute book of the Council shall be on the table at each meeting for the inspection of any member, and extracts therefrom may, with the consent of the chairman, be read to the meeting on the requisition of any member.

29. On occasions of exceptional interest the Council may make provision for a larger admission of visitors.

Annual Meetings.

30. The Annual Meeting of the members shall be held at such time and place as the Council may determine.

31. Fourteen days' notice of such meeting shall be sent to every member within the United Kingdom who has given his address to the Secretary, and notice of the meeting shall be advertised in such newspapers as the Council may direct.

32. The object of this meeting shall be to receive the Annual Report of the Council and the Treasurer's Balance Sheet, to hear the President's address, to elect the Council and officers for the ensuing year, and to transact any other business.

33. Any two ordinary members may nominate candidates for the Council or for office not later than one week prior to the day of election, and the names of candidates so nominated shall be at once put up in the rooms of the Society. The election of the Council and officers shall be by ballot.

Special General Meetings.

34. The Council may call a Special General Meeting of the Society whenever they shall consider it necessary, and they shall do so if required by 20 ordinary members.

35. A week's notice of the time and object of every Special Meeting shall be sent to all members. No other business shall be entertained than that of which notice has been thus given.

36. Twenty ordinary members shall form a quorum.

VI. COUNCIL AND OFFICERS.

The Council.

37. The government of the Society shall be entrusted to the Council, subject to the rules of the Society.

38. The Council shall annually elect a Chairman and Vice-Chairman.

39. The President or the Chairman, or any three members of the Council, may at any time call a meeting thereof, to which every member of the Council shall be summoned.

40. Seven shall form a quorum.

41. In order to secure the most efficient study and treatment of the various subjects which constitute the chief work of the Society, the Council may appoint Committees for special purposes. These Committees, with the approbation of the Council, may associate with themselves any persons—whether members of the Society or not—from whom they may desire to obtain special assistance or information. The Committee shall report to the Council the results of their proceedings.

42. The President, Chairman, Vice-Chairman of the Council, and the Honorary Secretaries, shall, by virtue of their offices, be members of all Committees appointed by the Council.

President and Vice-Presidents.

43. The President is, by virtue of his office, the chairman of all the meetings of the Society. In the absence of the President, one of the Vice-Presidents may preside.

Chairman of the Council.

44. It is the duty of the Chairman of the Council to see that the rules are properly observed, to call for reports and accounts from Committees and officers, and to summon, when necessary, special meetings of the Council and of Committees.

Treasurer.

45. The Treasurer has the charge of all accounts; he shall pay all accounts due by the Society after they have been examined and approved by the Council.

46. He shall see that all moneys due to the Society are collected, and shall have power, with the approval of the Council, to appoint a collector. All moneys received shall be immediately paid to the bankers of the Society.

47. The bank passbook and the book of accounts shall be laid upon the table at every ordinary meeting of the Council.

48. The accounts shall be audited annually by two members, who shall be elected at an ordinary meeting at least one month before the Annual Meeting.

Secretaries.

49. The duty of the Honorary Secretaries shall be :—

- (a) To conduct the correspondence of the Society and of the Council.
- (b) To attend the meetings of the members and of the Council, and minute their proceedings.
- (c) At the ordinary meetings, to announce gifts presented to the Society since their last meeting; to read the names of all new members and of candidates for admission, and the papers communicated to the Society, which have been directed by the Council to be read.

- (d) To have immediate superintendence of all persons employed, to make arrangements for the meetings of the Society, and to take charge of all maps, books, furniture and other effects.

50. It shall be the more especial duty of one of the Honorary Secretaries to conduct, as may be directed by the Council, correspondence with Foreign Societies, and with persons resident abroad.

51. In addition to the Honorary Secretaries, there shall be a paid Secretary appointed by the Council, whose duties shall be to assist the Honorary Secretaries, to issue the notices of the Council and of the Society, and to act under the instructions of the Council.

The foregoing rules, as now amended, were approved and adopted at a meeting of the members of the Society, of which due notice had been given to the members, held in the Town Hall, Manchester, Wednesday, October 3rd, 1894.

(Signed) GEORGE, President.

S. ALFRED STEINTHAL, Chairman.

F. ZIMMERN, Honorary Secretary.

JAS. D. WILDE, M.A., Honorary Secretary.

ELI SOWERBUTTS, Secretary.

[Copy.]

It is hereby certified that this Society is entitled to the benefit of the Act 6 and 7 Vict., Cap. 36, intituled "An Act to exempt from County, Borough, Parochial, and other Local Rates, Lands and Buildings occupied by Scientific or Literary Societies."

Seal of Registry of
Friendly Societies.

This 15th day of January, 1895.

E. W. B.

G Manchester Geographical
7 Society, Manchester, Eng.
M3 Journal
v.32-34

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